

ELEMENTS
OF
ANALYTICAL PSYCHOLOGY,

A SHORT COURSE

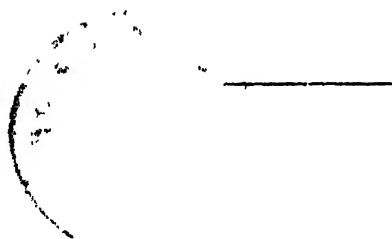
ADAPTED

AS AN INTRODUCTION TO PHILOSOPHY.

BY

HENRY STEPHEN, M. A.

FELLOW OF THE UNIVERSITY OF CALCUTTA.



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PREFATORY NOTE.

The short course contained in this volume follows in the main the syllabus at present in use in the Calcutta University. It aims at stating distinctly the fundamental questions of psychology, and indicating their bearing upon those questions of more general interest commonly included under the head of philosophy, and therefore confines itself to the method of reflection and analysis. The psycho-physical method, however great its promise for the future, has hardly as yet, in the conflict of studies, vindicated for itself a place in general education ; and the method of 'psychical research,' however great its suggestiveness and the prospects which it opens up, has failed as yet to establish definite results. Besides, the chief advantage of such study as a part of general education is to train the student to think and reason better on questions regarding which all must think and reason more or less ; and this end is best attained by the reflective method. Where the syllabus followed agrees closely with the text-books commonly used by students (those of Bain and Sully especially) the course, being intended as a help to students, follows in the main the order of topics and heads followed in these text-books (as under sensation, memory, attention) ; and the writer has to acknowledge his indebtedness to these authors. The stand-point and treatment however are considerably different. Following a prescribed syllabus has led to occasional repetition of the same topics, but this is perhaps not a disadvantage for the purpose intended.

Calcutta, 15th August, 1901.

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Muhammad Razvi Narim, B.A. Student.

ELEMENTS
OF
ANALYTICAL PSYCHOLOGY
AS
INTRODUCTION TO PHILOSOPHY.

PART I.

PSYCHOLOGY AND PHILOSOPHY.

I. PSYCHOLOGY.

§ 1. The word *psychology* was first used by the logician Goclenius, near the end of the 16th century, as the title of a work on the nature and origin of the human soul. It was little used until the 19th century, in the course of which it was adopted and used to mean *science of mind*. It has been restricted generally, however, to the nature and processes of the concrete individual mind, while the term "mental and moral science" has been used in a more comprehensive sense to include both this and the study of the products of collective mind, as in ethics, logic, sociology, history, politics, art and language. And the term "philosophy of mind" again, has been used in a still more comprehensive sense to include the study not only of the processes and products of mind, but also of the ultimate nature and substance of mind, and its relation to the rest of the world and to the absolute creative power (including, therefore, the form of study called metaphysics).

PART I.
CHAP. I.

Psychology
as science of
mind.

PART I.
CHAP. I.

But is a
science of
mind pos-
sible?

Comte's
objection.

Meanings of
the word,
mind.

Mind in the
empirical
sense.

Contrasted
with matter.

• But is science possible in the case of mind, in the same sense as in the case of other things? Mind can turn, its thinking activity outwards upon other things, and construct sciences of the earth and the stars, of minerals, plants and animals; but can it turn the same activity inwards upon itself so as to construct a science of mind? The contrast between mind and non-mental things, and between the process of observing mind, and observing other things, seems at first so great that some have thought that there cannot be a science of mind in the same sense as of external things. Mind, it has been said, can directly observe and study all phenomena except its own. The difference, however, is not really so great as it appears at first thought. Indeed, it would be nearer the truth to say that mind cannot know any phenomena except its own. For it can know other things only by knowing first the impressions or sensations which other things occasion in itself; that is, by knowing first itself and its own states and processes. We can know a fruit or flower only by observing the touch, colour, taste and smell which it gives us; and these are affections of our own minds. Hence, self-consciousness and self-observation, which are the original methods of mental science, are involved, therefore, in all other sciences as well. All science begins as self-knowledge, and it is only through the medium of self-knowledge that other knowledge is possible.

§2. Still the meaning and province of psychology as science of mind will depend on what precisely is meant by *Mind* and by *Science*.

I, Now, as to the word *Mind*,—it is used in the first place, (a) as a collective term for that class of states and activities which are distinguished from others by their attribute of being performed consciously; that is, for the states and processes of feeling, thinking and willing, in all their different forms, such as tasting, seeing, touching, perceiving, remembering, reasoning, desiring, deliberating, and so on. These are distinguished by this attribute of being conscious from another series of states and activities which we believe to be unconscious, and to go on of themselves independently of all consciousness,—such as the flowing of the river, the turning of the wheel, the explo-

sion of the mine. We call the conscious series *mental phenomena*, and may speak of them collectively as constituting mind; and the non-conscious series we call *physical phenomena*, and sometimes speak of them collectively as constituting matter, nature, or the external world.

• The above, then, is one possible use of the word *mind*, viz., as a collective term for the states and processes of feeling, thinking and willing, which constitute the "stream of consciousness," and are called mental phenomena. This is sometimes called the *empirical conception* of mind, because only the states and processes can be said to enter into *experience*.

(b) But this meaning evidently does not exhaust all that we mean by mind. We cannot think of states and activities without thinking of something of which they are the states and activities—of feeling, knowing and willing without thinking of something which feels, knows and wills. In other words, we must think of a *substance or entity* underlying, supporting and manifesting itself in the states and processes of consciousness, apart from which the states and processes themselves are but empty abstractions. Hence the word *mind* may be used also to denote this mental substance or entity which underlies and manifests itself in the mental phenomena of thinking, feeling and willing, and gives them the connection and unity of a single mind.

In this sense, viz. as mental substance, it is sometimes spoken of also as *soul*. And this is called the *metaphysical conception* of mind, because the *substance* of things is said to be known only by abstract reasoning, and not directly by experience like the phenomena. It is said to be a *noumenon*, or something merely *thought*, and filled in by thinking reason, and not a *phenomenon*, or appearance manifest to experience.

(c) It can be seen, however, that each of the above senses of the word *mind* is one-sided and incomplete, when taken by itself. The states and processes, or so-called phenomena, are nothing apart from the substance which

PART I.
CHAP. I.

In the metaphysical sense.

In the philosophical sense.

PART I.
CHAP. I.

supports them, and gives them their order and connection; and the substance is nothing apart from the states and processes in which it expresses and manifests itself, and realizes its own nature. Taken by itself, each is but a logical abstraction without any reality of its own. They are only two aspects of the same thing, and the real concrete thing is the unity constituted by the two in correlation.

Hence the most correct use of the word mind will be for the concrete reality made up of the processes of thinking, feeling and willing (the *phenomena*) and the something which thinks, feels and wills (the *substance*) as correlative factors of the same thing.

Thus we see that the word mind may be used in three senses—(i) for the mental *states* and *processes* of thinking, feeling and willing considered apart from their substance; (ii) for the *entity* which thinks, feels and wills considered apart from its states and activities; and (iii) for the *concrete unity of both*. These we may distinguish as the *empirical*, *metaphysical* and *philosophical* senses of the word.

§3. II. *Next, as to the term Science*,—the term is used, generally speaking, for the process of analysing things (or *phenomena*, as it is customary to say) into their constituent parts and elements; discovering the causes which have made them to be what they are, and their properties or powers of causing effects in other things, and the laws according to which the forces which produce them, and the forces which they exercise on other things, operate. In other words, science is the attempt to determine the constitution, the causes and effects, and the laws of things. It attempts to answer the questions, what? why? and how?—*what* things are (their *constitution*) *why* they are what they are (their *causes*) and *how* they come to be what they are (the *laws* of their causes).

And, to be truly scientific, its results (1) must be *general*, *i. e.* must be true not of one thing here and there, and now and then, but of all things of the same kind, at all times. And (2) its results must be at least approximately *certain*, *i. e.* established by observation or inference, as

General
meaning of
science—the
constitution,
causes and
laws of
things.

distinguished from propositions resting on mere conjecture or probability. And there is now a tendency, it may be added, (3) to restrict the term science to experimental investigations, or those which deal with concrete things and proceed by what is called the *inductive method*, i. e. by direct observation of things (aided by analysis and, where possible, by experiment), and inductive inference from the particular facts observed, to general conclusions capable of being verified by future observation. And at the same time, (4) it is generally insisted upon (as a consequence of the above characteristics) that science deals with things only as *phenomena*, and not as *substances*, i. e. with their outward manifestations to the senses, and not with the things as they are absolutely in themselves.

* Thus, physiology consists in resolving organisms into their constituent elements, tissues and organs; and discovering how the constituent cells and organs co-operate so as to promote the life and growth of the whole, and what causes lead to their development, connection and harmony as factors of a single living whole. Chemistry resolves material compounds into their constituent elements, and determines the properties of each, (i. e. its powers of producing effects on other things), and the laws according to which they operate. The above characteristics do not apply equally, however, to mathematics, which is not experimental in this sense, but starts from ideas of the mind, analyses them mentally, and arrives at their properties by deduction, without any experiment on, or even observation of external things.

§4. This, then, brings us back to the question, Is a science of mind possible in the same sense as of other things? The above different senses of mind will lead to *different ways of regarding and investigating mind*. Does any of them, then, accord with the above general definition of science?

(a) It is commonly assumed that, to be truly scientific, an investigation must proceed by observation and experiment, and that its conclusions must be reached by

PART IV
CHAP. II

Distinguishing characteristics of scientific results.

In what sense then is mental science possible?

Scientific methods applicable only to phenomena.

PART I.
CHAP. I.

inductive generalization, and be capable of being verified by observation. Now this is possible, it is assumed, only in the case of the outward manifestations of things, their properties and processes as they appear to experience—in other words, of the *phenomena* of things. The phenomena, it is assumed, can be isolated and studied apart from the substances which produce them, and this is practicable not only in the case of physical phenomena, but of mental ones also. Science proper, therefore, can deal only with phenomena.

• The substance or reality which produces and manifests itself in the phenomena cannot be observed nor experimented on (being only a *noumenon*); and, therefore, must (even if it be possible at all) be relegated to another form of inquiry called *metaphysic*; which proceeds not by observation and induction, but by analysis of, and deduction from fundamental ideas of reason, so that its results cannot be outwardly verified.

⇒
Hence science
of mind can
deal only with
phenomena of
mind.

Therefore, if psychology is to be possible as a science of mind, it must limit itself to the phenomena of mind, *i.e.*, to the conscious states and processes of thinking, feeling and willing in their different forms. In other words, it must regard mind as merely the aggregate of mental phenomena or conscious states—the *stream of consciousness*—and leave the question regarding the substance of mind, or reality which manifests itself in these phenomena, to another form of inquiry, not scientific in the same sense.

Psychology
as science

* Thus, psychology as a science is made to consist in the observation and analysis of the conscious states and processes of feeling, thinking and willing, with a view to determine the elements of which they are composed, and the laws according to which these elements combine and co-operate so as to make one mental life and evolve the products called mental, such as knowledge, art, and society.

Must be
purely
empirical.

These manifestations and products can be studied and understood, it is assumed, without any reference to the

reality manifesting itself in them; and in this way psychology can be treated as a science in the same sense as the sciences of nature. And it is only by this limitation of its sphere to the processes and products of mind that there can be a science of psychology.

* This, then, is *empirical* or *experiential* psychology, which claims to be the truly scientific study of mind. It received its impulse from Hume, James and J. S. Mill, Bain, Spencer, and more recently, Wundt. It aims more at the accumulation of facts than at the understanding of them—more at knowledge and utility, than at theory and logical completeness of system.

(b) But there is another way of studying mind which belongs to philosophy, if not to science. It may be thought that this attempted isolation of phenomena from substance,—of feeling, thinking and willing from what feels, thinks and wills,—does violence to common sense. Indeed, in dealing with the states and processes of mind, some theory is always tacitly assumed as to their substance and ground. And the theory thus irresponsibly assumed by the empirical psychologist may be a crude and uncritical one, and such uncritical assumptions may vitiate his whole science. Hence, a truly philosophical psychology must not pretend to deal with the processes alone, but must take into account the substance which underlies them, and treat mind as the concrete reality made up of substance and manifestations.

Hence, the higher and more philosophical method is to analyse the processes in order to determine from them the nature of the mental substance; and to use the idea thus obtained of the fundamental reality to explain deductively the nature of the states and processes, showing how they arise out of the nature of the thinking principle, and thereby how they combine and co-operate as factors of one concrete mind. This, then, is equivalent to applying both the experimental and the metaphysical, the inductive and the

PART. I.
CHAP. II.

But philosophy includes metaphysic of mind.

Philosophical study of mind.

PART I.
CHAP. I.

deductive methods together; so as to supplement each other reciprocally.

This may be called the *rational* or *philosophical* conception of mind and of psychology, and has been common to Aristotle in ancient, and Leibnitz and writers of the schools of Hegel and Herbart in modern times. It aims not so much at the accumulation of new facts, as at the understanding and explaining of those already known—making them intelligible to reason. But it is open always to the charge, that its results are partly speculative and hypothetical, and not strictly verifiable by experience in the same sense as those of natural science.

The purely empirical study of mind has been carried on mainly in connection with the empirical and sensationist philosophy of Hume and Comte; which leads to the result that nothing can be known except *phenomena*, and the order in which they have accompanied and succeeded each other in the past, and may, therefore, be expected to accompany and succeed each other in the future. That one event causes another means merely that one phenomenon is always followed by another in experience. We cannot, therefore, learn any thing as to how the phenomena are produced, nor, therefore, as to the ground or substance out of which they spring. Metaphysical knowledge is therefore impossible—whether of mind or of matter.

Metaphysical psychology, on the contrary, is in harmony with the rationalistic philosophies of Aristotle, Leibnitz, Hegel and Herbart. It regards this restriction of knowledge to phenomena as based on the fallacy of substantializing abstractions. Phenomena are thereby treated as if they were substantial things, which could be observed and experimented on by themselves. Empiricists in thinking that they are dealing with phenomena alone, are merely deceiving themselves. They are always assuming tacitly some, perhaps uncritical theory of the substance underlying the phenomena. It is necessary, therefore, to attain a clear and self-consistent conception of *substance* and phenomena together, as factors of one concrete reality. This is the object of the great rationalistic systems of philosophy—those of Aristotle, Hegel and Herbart.

It follows that the province and sphere assigned to psychology depends greatly on the relation in which it is supposed to stand to science, metaphysic and philosophy, and this, therefore, requires further consideration.

II. PHILOSOPHY.

§ 5. It is common at the present day to say that science deals with *phenomena* only, and keeps clear of *metaphysic*; and to speak of mechanical, chemical, electrical, vital, and even of mental and social *phenomena*, as the provinces of the physical, biological and mental sciences. Yet *phenomenon* is one of those words which are used too often without any precise definition, and therefore lead to much confusion of thought. What does it really mean?

The word means literally what is *shown or manifested*, and is used for the *appearances* or *manifestations* of things—the forms under which they *appear, exhibit, manifest* themselves. It implies, therefore, a distinction between what things really are in themselves, and the forms under which they manifest themselves to other things. How then do things manifest themselves to other things? Evidently by producing *effects* or *changes* in them.

Thus, the falling of bodies, the turning of the compass, the lightning flash, and the shattering of the tree, the selection and assimilation of nutritive materials, the building of houses, making of machines, and writing of books, may be said to be *phenomena*, or manifestations, revealing the presence and operation of what are apparently substantial realities, physical and mental—being really effects which these realities produce by their various modes of operation, magnetic, electrical, vital, mental.

* But even within the limits of this general meaning, the word *phenomenon* may be used with a wider and a narrower range of application:—

(a) With an *objective* application, *i. e.* to things external to, and independent of, mind. It may be used for all the changes which things produce in other things;

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CHAP. II.

Distinction of
phenomenon
and reality.

Manifestation
and what ma-
nifests itself.

Ambiguity of
the word phe-
nomenon.

Its general
use.

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CHAP. II.

so that the world may be said to be an aggregate, consisting of substantial realities and the phenomena or changes which these realities are constantly producing in each other by their reciprocal action and reaction—independently of any perceiving mind, and whether perceived or not (the adjective *objective* being used to connote the quality of being independent of mind in general, or at least of any particular mind). Thus science, in speaking of astronomical, chemical and vital phenomena, thinks of them as processes going on objectively, whether there is any mind to perceive them or not.

Its stricter
sense.

(b) With a *subjective* application, i. e. to states and processes of mind. Though often used loosely in the above sense for all kinds of changes, yet the term can be used consistently only where there is reference to a perceiving mind; because, to speak correctly, a thing can ~~appear or manifest itself~~ only to a mind which can be conscious of the manifestation, and understand what it manifests. (Correctly, therefore, the term phenomenon should be used only for those effects or changes which things occasion in perceiving minds.) Hence, all phenomena are in the first instance really mental; and it is only when they are understood to be occasioned by states and changes of external things that they can be thought of as (indirectly) phenomena of the external world also.

All phenomena
in first instance
mental.

Now the mental states which we feel to be caused or occasioned in us by external things, are those which we call *sensations*—*viz.* those states of our consciousness which we feel to be forced upon us from without, whether we are willing or not, e. g. the heat of the sun, the flash of the lightning and the sound of the thunder, the touch and colour of the flower, and the like. These mental states we come to understand as phenomena, or manifestations of external things.

Hence it is by interpreting, so to speak, the sensations which they occasion in us, that we come to know that there are other things besides ourselves, and to understand their qualities and relations. It is only through these sensations, therefore, that they can be said to appear or manifest themselves to conscious experience. To a thinking being, therefore, the real phenomena of the external world are his own sensations. Hence, when it is said that science deals only with phenomena, this should be understood to mean that it deals with things only in so far as they manifest themselves, and can be represented, *in terms of actual and possible sensations.*

Hence, if it be true that science deals only with phenomena, it follows that, to science, a thing will be merely, as Mill says, "a permanent possibility of sensations," *i. e.* a possible aggregate or cluster of sensations which any and every mind may experience under certain conditions. These subjective effects will be the phenomena of objective things in the correct sense of the word.

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CHAP. II.

§ 6. Now this definition of the term *phenomenon* will help us to understand better the distinction commonly drawn between science and metaphysic. It is now clear that a thing may be thought of under either of two aspects:—(1) we may think of it as it manifests itself to us in our sense-experience, and is represented by us in terms of our sensations, and of the ideas in which sense-experience is retained and reproduced—in other words, we may think of it as *phenomenon* merely. (2) But we do not believe that the thing is nothing more than a possible aggregate of sensations or ideas within our own consciousness; we believe that it exists outside and independent of our own, and of every individual mind, and occasions the sensations in our own minds, and in all others with which it comes into relation. This is what we mean by saying that it has *real* or substantial existence.

Hence, distinction of science, metaphysic and philosophy.

Hence it would appear from this that there are two possible spheres of investigation with regard to things, *viz.* as phenomena and as realities. These are the spheres of science and metaphysic. But these imply a third form of study which will combine the results of both these into one connected system, *viz.* philosophy. Now—

As to Science—It is possible to investigate things as *phenomena* merely, that is, as they manifest themselves to us by the *effects which they produce in our conscious experience*. We may think of a thing merely as the cluster of sensations which it gives us, or has given, or would give, were we present to receive them, *i. e.* in terms of its *phenomena* merely.

Science in terms of experience.

PART I.
CHAP. II.

Thus we think of past, distant and future things and events in terms of the conscious experiences, *i. e.* of the sensations, which they would have given, or will give to ourselves, or other sensitive beings constituted like ourselves. The geologist thinks the ages before men existed on the earth, by imagining himself present, and picturing the great tree-ferns, and pines, and the gigantic flying lizards and armoured sloths, as they would have appeared to his own eyes, had he been present.

Its advantages.

* This thinking of things in terms of *phenomena*, and conceiving how they would have appeared, or will appear to sense-experience, is *experiential* or *empirical* knowledge ; and it is agreed that the sciences deal with things only in this sense—in other words, that they do not consider the question, what things may be in themselves apart from our own sensations, but only the forms which they assume when represented in terms of our sense-experience ; and are satisfied with determining how they will appear, or would have appeared, to the senses. And the strength and importance of this *scientific* point of view, as distinguished from the metaphysical, consists in this, (1) that scientific knowledge is more or less *practical*, for what is of really practical importance to us with regard to things, is to know how they will *affect us*—whether beneficially or injuriously—when we come into relation with them ; and (2) that the results of science are generally capable of being subsequently *verified* by new experiences. (§ 3).

The positive sciences—definition and classification.

And the sciences are further distinguished from philosophy in this, that they deal, not with the whole sphere of being, nor even of phenomena, but only with separate departments of phenomena considered apart from each other. Hence the different sciences are distinguished from each other according to the different departments of phenomena with which they deal, and fall thereby into three main divisions :—

* (1) Some deal with the phenomena in which *inanimate matter* manifests itself, and are called the *physical sciences*—astronomy, mechanics, mineralogy, chemistry, etc.

And in connection with these, may be mentioned those

which deal with the modes of space under which physical phenomena universally manifest themselves to our senses—viz. form, magnitude, number, considered in the abstract, apart from the phenomena themselves. These are called the mathematics, but differ in method from the other sciences, and are now often regarded as occupying a position apart from them.

(ii) Others deal with the phenomena in which life manifests itself, and are called the *biological sciences*—botany, zoology, physiology etc.

(iii) And others deal with the phenomena in which mind manifests itself, and are called the *mental sciences*—psychology, ethics, logic, sociology, æsthetics, etc.

A science, therefore, (defined according to its results), may be said to be a body of general propositions, belonging to some one of these departments; affirming that such and such phenomena always present themselves in such and such an order and connection, under such and such circumstances; and verified by observation, and, where possible, by experiment.

§ 7. *As to Metaphysic.*—A little reflection may convince us, however, that what is immediately present in our experience (in the case of physical things at least) is not the real things as they are in themselves, but only *phenomena* or manifestations of them, viz. the sensations which they occasion in us; and that the real things exist independent of our sensations, and constitute a world of substantial realities, acting and reacting on each other, and going on all the same whether there are human beings present to be affected by them or not. This peculiarity of being independent of finite minds is expressed by saying that things exist *objectively, extra-mentally, or absolutely*.

Now, believing this, we cannot avoid inquiring what phenomena themselves *imply* as to the realities which exist behind, and give rise to the phenomena—for it is evident that we can know such things only through the medium of their manifestations. And the processes and methods of thinking by which we thus reason from phenomena to the objective realities which manifest themselves in phenomena,

But thought must rise from phenomena to reality.

Hence function and method of metaphysic.

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and the effort to conceive these realities, mental and material, as they are in themselves, and to understand how they act and react on each other so as to produce phenomena, are called *metaphysic*. It differs from science not only in the kind of knowledge which it aims at, but also in its method. While science proper proceeds by observation of things, and experiment upon them as they appear to the senses, and induction from observed facts to general laws; metaphysic proceeds by analysis of ideas into their simplest contents in order to discover what is implied in them regarding the objective realities which they are supposed to represent; and by pure reasoning from the ideas to the realities.

• Thus experiential science assumes such ideas as substance, matter, space, soul, force, cause, time, action and reaction, infinity and the like, and psychology as science seeks to explain how these such ideas arise in the course of our experience. But we cannot avoid going beyond this, and inquiring whether, and in what sense, these ideas of the mind correspond to realities existing outside and independent of our mind; and how these realities can be supposed, by their activities and interactions, to give rise to the world of finite minds and things and their phenomena. Such inquires into what is above experience, and how experience is produced, evidently suppose methods different from inquiries into the contents of experience itself, and are called metaphysic.

• Now this kind of inquiry must centre largely, it is evident, round those most fundamental ideas which lie at the root of all experience—*viz. substantiality*, or the question what real existence must be conceived to consist in, and *causality*, or the question how real things must be conceived to depend and react on each other, so as to form a connected system of things; while these inquiries will lead to the further question, what mind and matter are in themselves, and how they are connected together in the living body, and to the question of the absolute reality from which both mind and matter derive their origin, *viz. the absolute, or God*.

* Questions of this kind were called by Aristotle and Bacon, *primary* or fundamental philosophy. Aristotle's treatise on primary philosophy was afterwards arranged by his editors, in the body of his collected works, after the treatises on the physical, *i. e.* natural sciences, and hence came afterwards to be called the *metaphysics*, *i. e.* what comes after the treatises on nature. The term thus accidentally applied to Aristotle's work became at last a name for the kind of subject dealt with in that treatise. And it is appropriate in this sense, that a word which originally meant, which comes after the natural, may be applied also to mean, what lies behind the experiential or phenomenal world and gives rise to it.

Another name often applied to this kind of investigation, and even to philosophy as a whole, is "theory or science of knowledge," or "science of principles." This is too narrow for philosophy, but well expresses the nature of metaphysic. For we cannot be sure that we know what things in themselves are, *e. g.* such things as *substance, causality, soul, matter*, without knowing *how we know* what they are; and we cannot know how we know, without knowing *what it is* that we know, and *how far* we know it. Thus metaphysic is the analysis and criticism of the fundamental ideas and principles involved in all knowledge, with a view to clear away whatever contradictions may be involved in them as commonly understood, and determine what is necessarily implied in them as to realities beyond. It seeks to determine *what mind must be in order to know nature, and what nature must be in order that it may be known by mind*. Two constituents of it are sometimes distinguished—*epistemology*, or theory of knowing, determining the conditions and factors necessarily involved in the knowing of reality; and *ontology*, or theory of being, determining what is necessarily implied in knowledge as to the reality known.

There are some thinkers called sceptics and positivists, who deny the possibility of metaphysical knowledge, at least in the sense of ontology, and maintain that real knowledge is limited to the field of phenomena or experience. But this is equivalent to limiting it, as Hume and Mill have shown, to the sphere of possible sensations and clusters of sensation. And this limitation, again, leads always to the result of identifying the sensations and clusters of sensation themselves with reality; which is evidently the fallacy of substantializing abstractions. And again, the rejection of metaphysical inquiry seems

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Origin of the name.

Metaphysic and theory of knowledge.

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to be always accompanied by some misunderstanding of its meaning and method. It is, after all, only the effort to *think correctly* about matters regarding which no one can help; thinking in some way or another. And the question of the truth of experience is so involved in experience itself and in the nature of reason, that the attempt to exclude it always defeats itself, and metaphysical thought, though excluded for a time, always forces itself back more imperiously than before.

Function of
philosophy.

§ 8. *As to Philosophy.*—The above division of the province of knowledge into a plurality of spheres,—*vis.*, those of the sciences which deal with phenomena and that of metaphysic which deals with reality—seems to necessitate another form of investigation which will unite the highest results of the sciences and of metaphysic into one systematic whole of knowledge. This is the function of philosophy.

Definitions.

Different definitions are given of philosophy, e.g., that it is "science of knowledge," *i. e.*, inquiry into the way, in which our conception of the world is attained; "science of principles," inquiry *i. e.*, into the origin and import of the fundamental ideas and propositions (axioms) upon which our knowledge of the world is based; "science of the absolute, *i. e.*, of the ultimate and self-existent reality and power which manifests itself in the world; "the ultimate unification of the highest results of experience, *i. e.*, the drawing and combining of the results of the experiential sciences so as to form a conception of the world of experience as a whole.

Hence the one which expresses its meaning best and includes all the rest is, that it is the continuous effort to attain to a conception of the world of mind and nature as a whole, which will be free from contradictions within itself, and will agree with, and help us to understand better, the facts of experience. In this sense, it certainly corresponds to an essential want of the mind, for it is the very nature of understanding to strive after order,

connection, and unity everywhere; and until this is attained, there is a feeling of the incompleteness and insufficiency of knowledge, and consequent perplexity and unrest. Hence it seems to be necessary for the mind to rest upon some ultimate hypothesis regarding the world as a whole, and its own relation to it, *i. e.* a philosophy.

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And, in its higher and more reasoned forms, philosophy proceeds by drawing the highest results of the experiential sciences, and reconciling and combining them with the best results of metaphysical reflection; and seeking to arrive thereby at an adequate notion of an ultimate substantial reality, from which it may explain the world of finite things and minds deductively, *i. e.* by showing how they follow as products from the operation of the ultimate power, and form with it one organic, intelligible world-whole.

Method.

* But it may be safely said that every thinking being has a philosophy of some kind, however crude; and that the object of philosophical study is not so much to provide us with a conception of the world, as to correct what conception we already have; to clear away the contradictions involved in all popular conceptions; and introduce the new ideas and new points of view which are always opening up with the advance of scientific knowledge, and more accurate methods of metaphysical thought.

The relation between the sciences and philosophy is a subject of frequent discussion. The sciences without philosophy, it is said, give an aggregate of units without organic unity, like body without soul; while philosophy without the sciences, would be like soul without body. More precisely, the sciences seek to determine what the phenomena or manifestations of the world are, or would be, to the conscious experience of beings constituted like ourselves; while philosophy, again, (aided by metaphysic) seeks to explain what phenomena mean; and to make these phenomena intelligible to the understanding, by showing how they arise as factors of one connected world-system, by the productive energy of one absolute world-power. The sciences seek to determine the contents of the world as they appear to the senses; philosophy, to understand the fundamental force or life which evolves and gives con-

Relation of
science and
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Methods and
forms of phi-
losophy.

The world in
terms of phe-
nomena, i. e.,
possible sen-
sations.

nection and unity to these contents. Hence, in method, while the sciences are mainly *analytical* and *inductive*, dissecting nature, so to speak, into its constituent elements as the anatomist does the body, and generalizing from particular facts to general truths; philosophy is to some extent, indeed, inductive, *viz.*, in so far as it starts from, and draws the results of, the various sciences, but is mainly *deductive*—seeking to understand how the parts and their working follow from the plan and the purpose of the whole, as the organs and their working result from the life of the organism.

But from the distinction which has been made with regard to the two aspects of things—phenomenal and transcendental, things as they appear, and things as they are—it follows that there will be two forms, or at least two stages, of philosophical inquiry; and, indeed, throughout its whole history philosophy has been divided into two schools on the basis of that distinction—an *experiential school*, limiting the world-whole with which philosophy deals to the series of phenomena or possible experiences (though often identifying phenomena themselves with reality); and a *rational school*, seeking by means of metaphysical reasoning to penetrate beyond phenomena to reality, and comprehend the world as a *real* whole of substance and phenomena, and thereby understand how phenomena arise. Hence:—

1. *Empirical Philosophy*.—It may be thought possible to construct a conception of the world wholly in terms of phenomena, or of "experience"—in other words, of the world as it would manifest itself to the sense-experience of a spectator constituted like ourselves, and present to it throughout its whole extent and history. Such an observer may be supposed to receive the sensations which the processes of the world would give him, and retain them in the form of ideas, in the order and connection in which he experienced them; and thus to have a connected system of ideas corresponding to his experiences of the world, without making any attempt to go

beyond his sensations and understand what is implied in them, (thus avoiding metaphysic.) / Now empirical philosophy starts from the knowledge of actual experiences supplied by history and the sciences; and generalizes from what has actually been experienced, to what would or might have been experienced by such an universal spectator; and tries to picture the whole world-process as it would appear to him. This, then, is equivalent to conceiving the world in terms of experience or phenomena, that is, simply in terms of possible sensations and feelings. And the effort to attain to such a conception is philosophy in the sense to which it is limited by the sceptics, Hume and Mill, and the positivists, Comte.

* The most complete attempt at a *theory of the world* (or rather of that portion only with which we are directly connected, *viz.* our own solar system) on purely empirical lines, is seen in Herbert Spencer's "Synthetic Philosophy" which begins—

Example.

(i) In "*First Principles*" and "*Essays*," with the ideas of matter, motion, and conservation of energy, as they appear to experience, and are assumed in physical science; and the probable origin of the sun, earth, planets, and moons, by motion and gravitation, operating within a nebula of "cosmic dust" or "vapour"; and then—

(ii) In "*Principles of Biology*," endeavours to show how, on the newly solidified and gradually cooling globe of inanimate matter, living organisms made their appearance in their most elementary forms, consisting of minute globules of protoplasm; and how, in the course of ages they developed by continuous differentiation and integration, through innumerable intermediate forms, into the species of plants and animals which now cover the earth; and next—

(iii) In "*Principles of Psychology*," tries to explain how mind, from the elementary feelings of want and satisfaction, pain and pleasure, which may be supposed to exist in the lowest animal organisms, develops through all intermediate stages of complexity, until at last the human mind emerges; and how the individual mind, from its rudimentary stage in the infant, develops into the complicate system of feelings, ideas, and volitions which constitutes the mature mind; and finally—

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(iv) In "*Principles of Sociology*," shows how individual minds necessarily joined themselves together into societies for mutual help and defence, and developed manners and customs, moral laws and habits, forms of government and religion, and arts and sciences, rising gradually from lower forms to those prevailing at the present day.

And this philosophy of Spencer's pretends to be purely empirical, *i. e.* to describe the origin and history of the world simply as they would have impressed themselves on the experience of a spectator like ourselves; and to describe the order and connection of events (viewed as phenomena merely) in time and space, without any attempt to explain the ground, reason, or ultimate cause out of which they spring (which is described as the *unknown and unknowable*.)

The world as
concrete reality
of substance and
phenomena.

II. *Rational Philosophy*—which supplements empirical investigation with metaphysical criticism, and seeks to rise to the ultimate unity of both phenomena and reality in the *absolute* or *self-existent*. Thus, it subjects experience to metaphysical analysis, to determine what is really implied in it as to the realities out of which it springs, and to reach back to an ultimate reality; and seeks to explain both phenomena and finite realities as factors in one connected whole, having its ground in one ultimate reality, which philosophy calls the absolute, and theology calls God.

• It denies therefore that phenomena can be abstracted from reality, and studied and understood as things by themselves; and maintains that reason in thinking and understanding phenomena must think and understand the realities manifested in them. Experiential knowledge, therefore, assumes metaphysical results, whether acknowledged or not. Thus rationalism finds the empirical method to be superficial and uncritical. The conception of the world which empirical philosophy believes to be derived wholly from experience (impressed on mind from without like pictures in the camera) is not really such. It includes, indeed, materials from without, but these have been supplemented by such notions as substance and attribute, cause and effect, infinite and finite, absolute and relative, which are not impressed on mind

from without in the form of experience, but are constructed by its own intellectual power, and read into sensations in order to give them meaning.

Now rational philosophy aims at giving a reasoned account of these ideas, and of the realities implied in them, and thereby of the phenomena arising out of them; and at forming a conception of the world in which realities as well as phenomena will be accounted for. For philosophy aims at discovering connection and unity in things; and there can be no unity where there is nothing more than a series of phenomena or sensations experienced by a series of finite minds.

Thus philosophy, in the highest sense of the word, will draw, reconcile, and combine the highest results both of empirical investigation in the sense of Spencer, and of metaphysical, in the sense of Aristotle, and will seek to attain its end by the right use of both. And it follows that it will have three principal branches. Thus—

(1) *Philosophy of Mind* will avail itself of all that empirical psychology can teach as to the order and connection of mental phenomena; and, with the help of metaphysical criticism, will trace them back to the reality or substantial ground implied in them, which we speak of as *soul* or *spirit*—seeking to understand the relation between mind which knows, and the world which is known; or to determine what mind must be in order that it may be able to think and understand the world. This is sometimes called *rational psychology* also.

(2) *Philosophy of Nature* will avail itself of what science teaches as to the phenomena of external nature, and with the help of metaphysical analysis will trace them back to the substantial reality implied in them, which we speak of as *matter*; and will seek to explain the relation of matter to mind; or determine what matter must be in order that it may manifest itself to and be known of mind. This is sometimes called *rational cosmology*.

(3) Finally, *Philosophy of the Absolute* will avail itself of the results of the above, and seek to trace back

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A priori
philosophy.

the worlds of mind and nature to the unity of a single ultimate reality, by showing how finite minds and things arise as factors or products of the operation of one infinite and absolute power. If this could be explained, then the world would really be understood as a whole, which is the aim of philosophy.

• This kind of philosophy, which supplements empirical by metaphysical investigation, and combines the results of the two into a connected system, is sometimes called *rational*, because, in going beyond the phenomena of experience, it has to trust to pure abstract reasoning like mathematics; whereas empirical philosophy claims to rest more directly on the sciences of observation and experiment. It is also called *a priori* philosophy, because in order to understand sensations from without, the understanding has to supply notions, forms, or laws of thought from within, which are therefore, in a sense, *prior*, or antecedent to experience; whereas, according to the empirical way of thinking, all elements of knowledge are, without exception, *a posteriori*, i. e., derived from and therefore *posterior* to experience. Of the attempts to work out a reasoned conception of the world as a whole, the most elaborate are those of Aristotle in ancient, and Hegel and Herbart in modern times.

This leads us to consider more precisely the relation of psychology to science, metaphysic and philosophy as above defined.

II. PSYCHOLOGY, METAPHYSIC AND PHYSIOLOGY.

Relation of
psychology
to science.

§ 9. A positive science, as now understood, is the investigation of a particular department of phenomena by means of observation, analysis and experiment, with inductive inference from particular facts to general laws, and verification of these general conclusions by future observations. Now it is claimed for psychology that it is an empirical and experimental science in this sense, co-ordinate

with the natural sciences, and employing essentially the same methods of observation and experiment, the difference between them consists only in the subjects with which they deal. For, while psychology deals with the states and processes of mind with a view to analyse them into their elements and discover their laws and conditions, the natural sciences deal with the states and processes of something assumed to exist external to, and independent of mind—an extra-mental world. And they agree further, it is assumed, in this, that both deal with these states and processes, mental and non-mental, merely as *phenomena*; and avoid all questions of the *realities* or *substances* which produce the phenomena, *viz. soul* and *matter* in order that their results may remain unaffected whatever theory may be adopted regarding the substances and origin of the phenomena.

*Soul and matter form the subject-matter of *metaphysic*, which having no other method of investigation open to it than abstract reasoning without experimental verification, cannot be included among the sciences properly so called. Mathematics, it may be observed, occupies the same ambiguous position in so far as it is purely rational in its methods; but mathematical results are susceptible of experimental verification, which those of metaphysic are not—their only verification being their freedom from contradiction, and their explaining phenomena.

And yet it is easy to see that psychology is not wholly on the same line and level with the natural sciences, as is too often assumed. The physical or extra-mental world can be known to mind only through the ways in which it *affects* mind, *i.e.*, through the sensations of touch colour, etc., which it occasions and the processes of perception and thought which these give rise to. In other words, the subject-matter of the natural sciences themselves can be known only in terms of sensation and idea, which are the subject-matter of mental science. And it is only by a process of thought that we can reach from

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In one sense on the same level with natural science.

In another sense apart and distinct from it.

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these states and processes of our own minds to the states and processes of a world outside of our minds—the province of natural science. Thus mental science may be said to be logically anterior to physical, and the latter to be in a sense subject to the former.

Considered from this point of view, psychology may be said to occupy an intermediate position between philosophy and metaphysic on the one side, and the natural sciences on the other. Hence the tendency, in the older writers especially, to identify it with philosophy and metaphysic.

Metaphysic, on the other hand, takes up the question of the realities or substances which underlie and manifest themselves in phenomena; and the question how far the ideas of substance, causality, soul, matter, space and time, finite and infinite, and the like which psychology and the other sciences assume, correspond to actual realities existing independent of the minds which think them. These are not open to experimental investigation and verification in the same sense as phenomena, but can be dealt with only by abstract reasoning—analysis of fundamental ideas, and deduction from fundamental requirements of reason. Hence metaphysic does not stand in the same line with the sciences. These must avoid committing themselves to any particular metaphysical theory; and limit themselves to establishing results concerning phenomena merely; because these alone are capable of experimental verification, and when once established experimentally will remain true, whatever theory may be advanced concerning the realities behind them. Hence many psychologists endeavour to express their results in such a way as to render all reference to the substantial reality, or substance of mind, unnecessary.

But does the distinction, it may be asked, between *phenomena* and *reality* really apply to mind? What are mental phenomena? The above account of the province of psychology extends to mind the same distinction between phenomena and reality which is applied to external nature, assuming that the so-called phenomena are open to scientific investigation, and that the reality is not. But is the distinction really applicable to mind in the same sense as to nature? What is the meaning of mental phenomena? We find that the term mind is used really

Meaning of
mental phe-
nomena—two
senses.

in two different senses, giving two methods and two departments of mental science:—

1. One mind manifests itself to other minds by occasioning certain effects in the material world such as looks, sounds, movements, works; which, again, occasion effects (sensations) in other minds, which other minds can interpret as coming directly indeed from the material world, but indirectly from a mental cause. Thus the cries of the animal, the looks and movements of the child, the voice and gestures of the speaker, the laws of Rome, the temples of ancient Egypt, the ancient books of the Hindus, are phenomena, or manifestations of minds to other minds, through the medium of matter, and the sensations which it impresses from without.

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Manifestation
of other
minds to self.

En.

One class of mental phenomena, therefore, appeal to the perceiving mind from without, like material phenomena; and so far as they are concerned, the term will have the same meaning as when applied to the manifestations of material things, *i. e.* they be effects produced by things on mind from without. And it is mental phenomena of this kind that supply the materials of that method of psychological study which is called *objective*.

2. But the term is applied to mind in another sense also. Psychologists speak especially of the conscious states and processes of mind, such as feeling, perceiving, remembering, reasoning, fearing, loving, willing, and their conscious products, feelings, ideas, volitions and the like, as phenomena of mind. But the definition which applies to other phenomena does not apply to these. These are not effects occasioned in the mind by other things, but are states and activities of the mind itself. How then can we speak of them as phenomena? If we call them phenomena, it must be in a different sense of the word.

Manifestation
of self to self.

Now there is a sense in which we may speak of them as phenomena. It is only in and through its processes of thinking, feeling, willing, and the rest, that mind can become conscious of itself as mind. They are the materials of its own self-consciousness. These states and activities are, therefore, in a sense, *the mind's own manifestation of itself to itself*.

We may speak of them, therefore, as phenomena, if by that we mean, not effects occasioned in the mind by other things, but processes and activities in and through which mind reveals itself to itself, and becomes conscious

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of itself. And we may speak of these, the mind's manifestations of itself to itself, as the *subjective* or *internal* phenomena of mind, to distinguish them from the phenomena of other minds. It is they that form the material of the *subjective* or *introspective* method of psychological study.

* But there is this ambiguity to be guarded against,—that one class of mental states will have to be regarded as phenomena in both the above senses. Sensations are conscious processes of mind, and are at the same time effects occasioned in the mind by, or through other things. They are, therefore, (1) in one sense, *external* phenomena, in and through which the external world manifests to us its existence and attributes; and (2) in the other sense, *internal* or mental phenomena, in and through which the mind becomes aware of itself, and its attribute of sensibility.

Psychology
and Meta-
physic.

§ 10. We can now understand the relation between psychology as the science of mind and the metaphysic of mind, as now commonly conceived. It follows from the distinction made between phenomena and substance as applied to mind, that mind like nature may be regarded from two points of view—that of the states and processes, and that of the substance out of which they spring. Approached from one side, it gives the *scientific* study of mind or experiential psychology; from the other side, the *metaphysical* study of mind, which belongs to philosophy rather than to science proper. Thus on the one side we have :—

Psychology
without meta-
physic—mind
as aggregate
of pheno-
mena.

A. *Empirical Psychology*—which claims to be an experimental science like the sciences of nature, and limits itself to the study of the phenomena of mind in the above two senses; because it is only the phenomena, and not the reality in itself, that can be directly observed and experimented on. And all mental phenomena resolve ultimately into phenomena of the *internal* or *subjective* class, i.e. conscious states and processes of feeling, thinking, and willing as they appear to every one within his own self-conscious

ness ; because the *external* phenomena of mind, such as looks, movements, speech, and works, by which one mind manifests itself to another externally, are of psychological import only as an index of the *internal* phenomena—the thoughts, feelings, volitions—of the mind which manifests them.

PART II
CHAP. III

Aim of
scientific
psychology.

Hence empirical or scientific psychology regards mind, in the first instance, as merely the series or aggregate of actual and possible subjective phenomena, or conscious states and processes—of the sensations, perceptions, ideas, emotions, volitions which make up the conscious life of mind.* And the sole object which it sets before itself, is to determine the differences in kind and degree which prevail among these conscious states; to resolve the compound ones into their elements, and ascertain the laws according to which they follow each other in series, or become connected together into aggregates and compounds; and the connection between the states of consciousness which make up the contents of mind, and states of the bodily organism and external world—i.e. between mental and material phenomena.

* Thus it assumes that mind can observe and analyse its own states and processes, in the same way as it can those of the external world, and can understand the succession of changing states which make up its own conscious life, without having any theory or knowledge of what it itself is, as reality or substance.

* Indeed some, in their opposition to any metaphysical theory of mind, go so far as to say that the series of conscious states are not merely the contents or conscious manifestations of mind, but are mind itself—in other words, that mind is nothing more than the series of conscious states. Hence, as it is mind that studies mind, they are reduced to the paradox of saying that the series of conscious states knows and can study itself; or that the last state belonging to the series can observe and study the earlier ones. But, supplementing this one sided empiricism, we have on the other side :—

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Metaphysical
Psychology—
mind as
reality.

B. *Metaphysic of Mind*, as a part of philosophy.—
Phenomena are phenomena of something. If thinking, feeling and willing are phenomena of mind, then mind itself must be something which manifests itself to itself in and through these conscious processes—the something which thinks, feels, and wills, and by so doing, is conscious of *itself* as thinking, feeling and willing. This something is spoken of, from logical analogy, as the *subject* or *agent* which thinks and wills; and from an ontological point of view, as *soul* or the *substance* of mind; while a familiar term which may be used to include all aspects, is *self* or *ego*.

Now the nature of this fundamental reality underlying and manifesting itself in the conscious states, and giving them the order and connection which makes them to be one mind, and the connection of this with the other fundamental reality which manifests itself in the external phenomena of nature—this is really the fundamental question regarding mind. But it is not a question that can be settled by direct observation and experiment, but only by abstract analysis and reasoning; and is therefore separated from the study of the processes, and referred to metaphysic as a branch of philosophy.*

* For a sufficient account can be given, it is assumed, of the states and processes which make up mind in the empirical sense, and the states and processes of body with which they are connected, without ever considering the question what mind is, or body is, as a thing in itself; and thus a breach is made between the empirical and the metaphysical treatment of mind and nature.

From this we can see the relation between psychology and metaphysic. There is an empirical and a metaphysical aspect of mind; and the study of both may be called psychology, or science of the mind. But in recent English usage, the term psychology has become almost restricted to the empirical study of mind, and metaphysical inquiry excluded. Psychology meant originally the "science of soul"; but it has come to mean the science without the soul; in the sense that, as now studied, it avoids all questions of the soul.

§ 11. But mind is found always in connection with an organism, and the series of states and processes called mental is found to run parallel always to another series of the kind called physical, viz. those of the physical organism. Hence the scientific study of mind will involve that of the physical series which runs parallel to the mental, i.e. of physiology; and more especially of the physiology of those organs and processes which are most directly connected with mental processes.

*Thus when the meaning of body and external world has come to be understood, then the individual mind comes to understand also that there are other minds like itself; and that it can communicate with them, and they with it, through the medium of the physical world. But it comes to understand also that there is one portion of this physical world with which its own existence is bound up more intimately than with the rest, viz. its own organism; that it is by first occasioning processes in its organism that it causes changes in the extra-organic world, and thereby also in other organisms, and through them communicates with other minds; and that it is through changes imposed upon its own organism that it becomes aware of changes in the physical world, and in other minds. Seeing, then, that it is through the processes of the organism that mind communicates with, and forms a constituent of the world, it follows that a science of the mental processes must be, to some extent, a science of the organic ones also, which are involved in the mental; and that psychology must include an element of physiology:—

• (i) Thus mind is influenced by the external world through the medium of the organism; for when sensations arise in the mind from influences of the external world, there has been first an impression on some part of the organic surface specially prepared to receive it, e.g. the skin, eye, or ear; then a transmission of the force by special in-carrying channels of communication to the brain-centres; next, a diffusion thence of the aug-

Mind and organism—
mental series
and physical
series.

Relation of
mind and
organism.

Mental
impressions
received
through the
organism.

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Desires and volitions realised through the organism.

Thought and emotion accompanied by organic processes.

Hence the close connection of psychology and physiology—physiological psychology.

mented force, by out-carrying channels, through the whole body; and finally, as the response, so to speak, of the whole organism, the sensation arises in consciousness.

(ii) Again, mind re-acts on and influences the external world only through the medium of organism; for when mind reacts on the world, the mental process of desire and volition is accompanied by some physical process in the brain which communicates itself to the whole organism; and, in consequence of this, there is an adaption of the whole organism to physical work, and an outflow of energy along special channels to contract special muscles, and produce special movement.

(iii) And it is not only in interaction between mind and world, *i.e.* in sensation and volition, that mental processes are thus bound up with organic ones. Even in the purely subjective processes of thinking and feeling—in remembering, reasoning, fearing, hoping, and so forth, though there is no direct interaction with the extra-organic world, there is yet, along with the thought and feeling itself, a process of adjustment and co-operation throughout the whole organism, varying in kind and degree according to the mental process.

The relation of psychology to *physiology* however is complicated by this, that while psychology is itself the science of mental states, the organism, like all other material bodies, is known only through the medium of mental states. The organism, as well as the extra-organic world, manifests itself to the mind only in and through the sensations which it gives rise to; and, in considering the relation between mental and bodily processes, we have to assume beforehand the psychological process of perception, in which mind, by interpreting its own sensations, comes to know the existence and attributes of body. Hence we can know even our own bodies only in terms of our sensations and ideas. § 9.

It follows from this close connection between mental and organic processes, that an understanding of the organic is conducive to the right understanding of the mental. Hence the study of physiology has become auxiliary, and almost essential, to that of psychology. † Physiological psychology has indeed been limited mainly to the physiology of the brain, nervous system, and organs of sense, the working of which

seems to be most immediately connected with mental work. And it is commonly assumed that brain is in a special sense "the organ of mind,"—that organ, the processes of which correspond most directly to mental processes—some speaking almost as if a brain were itself sufficient for mental work, without a body. There is reason to believe, however, that the brain is merely the organ of unification, through which the organs of the body are co-ordinated and made to work in harmony so as to constitute a single organism; and that feeling results, not from the working of the brain merely, but from the co-ordinated working of the whole organism. Nevertheless, the very fact that the brain is the centre or channel of co-ordination, may be said to give it a more immediate connection with mind than the rest of the body has.

*For whether we admit with idealists, that mind (as active soul) is the evolving and co-ordinating power of the organism; or hold with materialists, that mind (as a mere series and aggregate of feelings) is merely the resultant or product of the co-ordinated working of the organism; or with others, that it is both cause and product in one,—still, in each of these cases, the nervous system, as the channel of co-ordination, will be, in a sense, more closely connected with mind than the rest of the body. And hence the department of physiology with which psychology will be most intimately connected, will be that of the nervous system and organs of sense.

But the usefulness of physiology in its bearing on mind has its limits, which are apt to be forgotten:—

(1) Neither physiology nor psychology (owing to the limits which they impose on themselves as merely empirical sciences of phenomena) can settle the question of the ultimate relation between mind and body. To do that would suppose an understanding of what mind and matter are in themselves as realities; and that is a question of metaphysic, not of experimental science.

Nevertheless they cannot work together without some provisional hypothesis as to the relation of the two kinds of phenomena with which they deal, and one which will be capable of, at least, approximate verification.

Limitations of
physiological
psychology.

PART I.
CHAP. III.

This is supplied in the *principle of concomitance*—that *for every mental process there is a corresponding process of the physical organism*. This is sufficiently established as far, at least, as concerns what may be called the "material" of mental processes *vis.* sensation, representation, emotion; though it can hardly be true, in the same sense, of the purely intellectual element, the activity of thinking, *i.e.* of discriminating, comparing, and understanding these materials. We cannot, however, convert the above proposition and say that, for every process of the organism, there is a corresponding process of mind,—though it is probable that every organic process affects, indirectly at least, the sum-total of consciousness.

(2) The mistake must be guarded against, of supposing that to explain a physical process of an organism, is equivalent to explaining the corresponding mental process. Though there is some correspondence between the two, yet (i) it is not a correspondence of kind, because the organic process is a complex of movements and moving molecules, while the corresponding feeling or idea has nothing in common with movements of anything; (ii) ~~nor~~ is there indeed any reason to believe it a *direct* or *immediate* correspondence; for there may be other forms of activity of which we know nothing, intervening between the molecular process and the mental one. Of the connection between the two series of processes, experimental science can give no explanation. All that it can say is, that when the one process occurs, the other occurs also.

(3) Another danger to be guarded against in physiological psychology, is that of substituting imagination for fact; and thinking to explain mental processes by imagining brain ones which may have no existence in reality, and may be even impossible in terms of molecules and motion (the constituents of brain), thus substituting a mere mythology of brain processes for science. Thus physiological psychology is in danger of degenerating into something that is neither physiology nor psychology.

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PART II.

BODY AND MIND.

IV. THE PHYSICAL SERIES.

PART II.
CHAP. IV.

Connection
of mind and
body from
empirical
point of view.

§ 12. Empirical psychology, in conformity with the limits which it imposes upon itself as a science of phenomena only, excludes the question of the ultimate relation of mind and body, soul and matter, as substantial realities. It limits itself to analysing the contents, and determining the relations of the two series of phenomena,—*viz.* on the one side, the series of conscious states and processes which constitute the mental life, and on the other, the series of molecular combinations and disintegrations which make up the life of the organism. And, for the general relation of the two series (in order to avoid any metaphysical theory as to their origin and connection), it lays down provisionally, or as sufficiently well established experimentally to serve as a "working hypothesis," the *principle of concomitance or parallelism, that for every state and process of mind there is a corresponding state and process of the organism.*

Parallelism of
mental and
bodily pro-
cesses.

Of this correspondence, three forms or phases, may be distinguished, corresponding to the three main phases or functions of mind (as indicated in § 11)—

(i) *In sensibility or mental receptivity*—in which mind is passively acted on, and conditioned by the external world,—the physical impressions are propagated from the organs of sense through the rest of the organism to the brain, and the resulting molecular processes of the brain are accompanied by the mental processes called sensations, *e. g.* pressure, heat or cold, sound, colour, and the like.

In sensation

PART II.
CHAP. IV.In intellection
and emotion.

(ii) *In intellectual activity*—in which mind turns the sensations thus impressed upon it into ideas, and, uses them as materials for thought and feeling, (as when it remembers, imagines, reasons, and feels fear, hope, sympathy, and so forth)—at this stage at least, it might be supposed that the mental is completely isolated from the physical, and that there are no bodily processes at all corresponding to the mental ones. But closer observation shows that there is not only an increase of circulation and heat in the brain, and therefore, of molecular work there but also an ebb and flow of activity through every part of the organism, corresponding to the kind and intensity of the thought and feeling.

And in cona-
tion

(iii) And finally, *in conation or mental reaction on the outer world*—in which mind, in consequence of its thought and feeling, appears to react on, and condition changes in the external world—the mental processes of desire and volition are accompanied by molecular processes of brain and organism, which result in an outflow of force by special nerves to contract certain muscles, and move certain limbs.

Empirical
psychology
excluded
from assum-
ing a relation
of cause and
effect between
body and
mind.

In the first and last of these cases, to be sure, the relation might appear to be one of precedence, as much as of concomitance. The physical impression on the organism seems to precede the sensation; and the mental desire and volition seem to precede the voluntary movements. And precedence seems to suggest *causation*, viz., that the physical impression *causes* the sensation, and the volition *causes* the movements of the limbs. But to say that there is a *causal* relation between mind and body—that matter acts on mind and mind on matter—would imply a *metaphysical* theory of mind and matter, as they are in themselves; and this is what empirical science must avoid. And further, causation in nature means the change of one mode of motion, *e. g.* molar, chemical, or electrical, into another—all physical work being movement of masses and molecules in space. But consciousness cannot be conceived as a mode of motion or movement of molecules. Therefore we cannot con-

ceive a *causal* interaction between mental and bodily processes, without having recourse to some metaphysical theory to explain it. Therefore empirical psychology must remain satisfied with expressing the relation as one of parallelism or concomitance merely.

Granting then that there is such a general concomitance and correlation between mental and organic processes, we have to enquire, *With what class of organic processes is it, that mental processes most directly correspond?* It may be thought, indeed, that consciousness cannot be "seated" in any particular part of the body, but is "all in every part," and corresponds equally to the whole. But the organism is composed of many parts, and these parts require to be co-ordinated, or made to work together as one complex system; and this co-ordination, we know, is effected through the *nervous system*; and of the nervous system, the central and controlling portion is the *cerebro-spinal axis*, and more especially its upper part, the *cerebrum* or *brain*. And we find that no change in any part of the organism enters into consciousness until its effects have been propagated along nerves to and through the upper brain. *

Hence, even if we venture upon a philosophical theory of the relation of mind and body, and (1) say with idealists that it is mind that evolves and co-ordinates the organs, we must admit that it is through the nervous system that it does it. And if (2) we hold, with materialists, that it is the co-ordinated processes of the organism that make the series of mental states, we must admit that it is through the working of the nervous system and brain that they make them. And if (3) we persist in going no further than the psychological theory of parallelism, we find that it is processes of the nervous system, and more especially of brain, that are most directly paralleled to mental processes. This is all that is meant by saying that brain is the "seat" or "organ" of mind.

And that there is a correspondence between mind and brain, more direct than between mind and the rest of

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CHAP. IV.

What bodily processes correspond most directly with mental processes?

Those of the nervous system and especially of the brain.

This is true, whatever theory we assume of the relation of mind and body.

What evidences are there of this correspondence?

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CHAP. IV.Interruption
of communi-
cation.

the body, seems to be proved by abundant experimental evidence :—

1. When communication is cut off between the brain and any part of the body, owing to the nerves of that part being diseased or cut, then there is no longer any feeling or sensation connected with that part. It becomes insensible to stimulus of every kind. This proves that the feeling is not really in the part itself—that the effect of the injury has to be transmitted along the nerves to the brain ; and that the sensation corresponds directly with a state of the brain, and only indirectly with the state of the part itself.

We imagine, of course, that taste is in the tongue, touch in the skin, and the pain of the cut, burn, or bruise in the hand or foot : but we shall see that this is only an acquired habit, by which we learn to localize our sensations in the parts which cause them.

Time required
for trans-
mission.

2. Psycho-physical experiments prove that there is a measurable interval of time between the application of a stimulus to any organ and the corresponding sensation, *e. g.* between the application of a sharp point or hot iron to the hand or foot, or the striking of a wave of ether against the retina, or of air against the drum of the ear, and the sensations of pain, light, or sound.

This proves that some process intervenes between the stimulation and the sensation ; which can hardly be any other than a process of transference along the nerves. And the fact, that it is the centre towards which all the nerves of the body converge, points to a conveyance of influences to, and concentration of consciousness by means of the brain.

3. This result is confirmed by what is known as to the state of the brain during thought and emotion—

State of the
brain during
mental work.

(1) Prolonged thought and intense emotion produce a feeling of fatigue and exhaustion in the head, until it is restored by rest ; and, if carried too far, produce pain and disorder of the brain. And a blow on the head at once causes suspension of consciousness.

(2) They are accompanied by a greatly increased flow of blood through the arteries and veins of the brain-centres, and by a great increase of heat in the brain; which proves that an increase of *mental work* is accompanied by an increase of *brain work*, and therefore, that they correspond to each other in some way; while any check to the supply of blood weakens thought, and soon leads to a cessation of consciousness. Indeed it is found that, though the brain is in bulk only about $\frac{1}{44}$ th of the bulk of the whole body, yet about $\frac{1}{8}$ th of the whole blood of the body is used up by the brain.

(3) This is further confirmed by the fact that intense mental activity of any kind is always followed by a casting off of certain waste materials which are evidently derived from the brain, proving that there has been increased brain-work and consumption of brain materials. Thus the quantity of phosphates and sulphates cast off varies with the amount of mental excitement, and these are products resulting chiefly from the waste of brain substance.

4. Comparison of the brains of the different species of animals, and different races of men, and even of different individuals, shows that there is a connection between intelligence and the size and complexity of the brain. Generally speaking, the larger the brain in relation to the rest of the body, and the more complex the convolutions of the hemispheres, the higher the intelligence. The average brain of civilized men weighs about 49 oz.—that of savage races, about 4 or 6 oz. less. Men of genius have risen as high as 63. Idiots do not rise above 30, and sink as low as 10. Comparatively small brains, however, may be superior in complexity and organisation, while larger ones, may be inferior in these respects. Hence the number of cells and nerve-fibres, if it could be estimated, would probably be a surer index of intelligence than size.

Brain development and mental efficiency.

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CHAP. IV.Structure of
the nervous
system.

Its parts.

Structure of
nerve.

§ 13. It follows from this correspondence between mind work and brain and nerve work, that physiological psychology is concerned mainly with the *structure and working of the nervous system*, which, being the apparatus of organic co-ordination, is for that reason the apparatus through which mind more especially manifests itself.

Now the nervous system consists of two principal parts—(A) the *cerebro-spinal axis*, consisting of the *spinal cord* with its enlarged continuation, the *brain* or *encephalon*, and constituting the central and most vital part; and (B) the *nerves* themselves, which form the lines of communication between the former and the rest of the organism, and carry currents of influence inwards and outwards, thereby regulating and co-ordinating the working of every organ and fibre, and making the many organs to work together as a single organism. Hence :—

(A). The *nerves*, as they appear to the naked eye, are white threads which can be seen issuing, (1) *some* directly from the brain through holes in the skull-bone, and entering into the organs of sense contained in the head, viz. the eye, ear, etc. (and therefore called *cranial nerves*); and (2) some from the spinal cord contained within the backbone, and running out along the limbs, and branching out and disappearing in the muscle-fibres and under the surface of the skin (called *spinal nerves*).

But those nerve-threads which are visible to the naked eye when examined microscopically, are seen really to be bundles, containing thousands of extremely slender fibrils which are the real nerves. These ultimate nerve-fibres are in some place from $\frac{1}{1600}$ to $\frac{1}{3600}$ of an inch in diameter, but towards their extremities may thin away to $\frac{1}{18000}$ or less. The optic nerve alone contains more than 100,000 fibrils.

The ultimate fibres are composed each of (1) a central *core* or *axis cylinder* of transparent protoplasmic substance, which is the essential part, and carries the nerve-currents outwards and inwards, as currents of vibration transmitted through its molecules; and (2) two tough

sheaths of white materials which surround and insulate the axis, as the wires in a telegraph cable have to be protected and insulated, to keep the currents of one from mingling with those of another.

But the nerves, though the same in appearance, are really of two kinds, serving two purposes :—

(1) One class serve to carry, *inwards to the brain* (from the organs of sense, muscles, and surfaces of the body), those currents which are stimulated by external things and forces, such as light, heat, pressure, etc., and which give rise to sensations of colour, sound, taste, smell touch, etc, corresponding to these forces. These are called *afferent* or *in-carrying* nerves, because they carry currents inwards from the external world to the brain ; and *sensory* nerves, because they carry those currents which give rise to sensations.

The ultimate fibres of the sensory nerves are exceedingly minute, their axes being generally not more than $\frac{1}{100000}$ of an inch in diameter ; and in the sensitive surface of the sense-organs, (e. g. the retina of the eye), they can be seen spreading out in a network, and terminating each in a minute protoplasmic bag or nerve-cell, much like those from which they start in the brain. Now, external forces, such as pressure, or waves of air or ether, striking against these surfaces, set up some kind of process in these terminal cells ; which, again, sets up an ingoing current to the brain (somewhat as the electric battery sends its current along the wire) ; and this current sets up those processes of the brain which correspond directly to sensations in the mind.

(2) Another class of nerves serve to carry currents *outwards from the brain* to the muscles of the organs and limbs and give rise to contractions of the muscle fibres, and thereby to motion of the limbs. Hence these are called *efferent* or *out-carrying* nerves, because they carry currents outwards, and *motor*, because they produce motion. Most of them are *voluntary*, i. e. the currents which they carry are under the command of will, (i. e. stimulated or repressed by will), as those which move the eyes and limbs ; but

~~Sensory~~

Motor nerves.

Voluntary
and involuntary.

PART. II.
CHAP. IV.

Eol

some are *involuntary*, i.e., the currents which they carry, and the movements which they produce, are not under the command of will, *e.g.* those which keep up the movements of the heart, and processes of circulation and digestion.

How distin-
guished.

Though the two classes of *sensory* and *motor* nerves are the same in appearance, and most of them for the greater part of their course bound up in the same bundles, (forming the silvery white threads which the unaided eye can trace, issuing from the backbone, and branching through the body), the distinction between them was discovered in this way. It was observed that every spinal nerve-thread issues from between the vertebræ of the spine in two branches—an *anterior* and a *posterior* one—which, after a little, join into one bundle. Now, it was found that when the *anterior* branch of a nerve-thread was cut in any animal, it lost all *power of moving* the limb into which that particular nerve-thread goes and branches out; but retained the *sensibility* or feeling of the limb. In other words, it continued to be sensible of touch, burns, cuts, etc. in the limb, though it could no longer move the limb. But on the other hand, when the *posterior* branch was cut, it lost all sensibility in the limb, but retained the full power of movement. This proved that the nerve bundles contain two kinds of nerves, one kind in-carrying, and sensory, the other out-carrying and motor.

Structure of
the axis.

§ 14 B. The *cerebro-spinal axis* is composed of two kinds of material, *white substance* and *grey*; and includes as its principal parts, (1) the *spinal cord*, or column of soft nervous matter contained within the backbone (commonly called the *medulla* or marrow), which enters the skull below, and spreads out into (2) the larger bodies which constitute the *encephalon* or *brain*.

Its consti-
tuents.

I. As to the *materials of cerebro-spinal axis*.—(a) The *white material* is found, on microscopic examination, to consist merely of masses of nerve-fibres, which enter between the vertebræ of the spine, and, forming the outer layer of the cord, ascend the interior of the spine to the brain; where they spread out, and finally enter into the *grey masses* of the brain; and thus serve to connect

Nerve fibres.

those grey bodies with each other, and with the rest of the organism.

(b) The *grey material*—which is the most vital part of the animal organism, and in some sense the very seat of life, and the part to which the other materials and organs of the body are subsidiary as means to end—requires further consideration.

On microscopic examination, it is found to be composed mainly of minute sacs, called *cells*, varying in size from $\frac{1}{100}$ th to $\frac{1}{1000}$ of an inch in diameter, and containing the liquid albuminous substance called *protoplasm*. The protoplasmic cell is not limited to the brain, but builds up the vital parts of every organism, both plant and animal. Indeed it is the ultimate unit of all organization and life; every living thing begins its existence as a single cell, and the most complex are built up of cells and materials secreted by, or developed by modification of cells, (as wood and vessels in plants, and bone, vessels, and muscle in animals and in man).

✓ The vital cell consists of (1) a *cell-wall*, or membrane, containing the protoplasm; (2) the *protoplasm* itself, a granulated liquid similar in appearance and composition to the albumen of an egg, and spoken of as the special material, or physical basis of life, because life is never found apart from it (idealism and vitalism holding the protoplasm to be a product of life, and materialism making life and mind to be products of protoplasm); and (3) a minute roundish body embedded in the protoplasm called the *nucleus*, generally containing a smaller body called the *nucleolus*. The nucleus would seem to be the seat of the cell's life, for when it is injured the cell dies. Cells multiply (and thereby organisms grow) by division of single cells into pairs, and the division takes place across the middle of the nucleus, each half forming a new cell.

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CHAP. IV.

Cells.

Protoplasm—
the "physical
basis of life."

Structure and
origin of
cells.

PART II.
CHAP. IV.Their relation
to life.

The cell-theory of life affirms that each cell is a living organism by itself, and that the collective life of the whole organism, plant or animal, is a resultant or product arising in some way from the amalgamation or fusion of the lives of the separate cells. This concentration of life is but slight in plants and the lower animals (parts of which when separated from the rest grow into complete organisms); but is rendered more perfect in the higher animals and man by means of the nervous system and brain.—the function of which is to concentrate and co-ordinate the life of the different cells. According to this view, the lives of the separate cells is logically anterior to that of the whole. The converse, however, is more probably the truth *viz* that it is the life of the whole that evolves and gives connection and life to the separate cells, making them its instruments, and realizing its own life in and through that of the many units. In this case the life of the whole will be logically anterior to that of the individual cells.

Nerve cells.

In man, vital cells in their original form line, and perform the work of the digestive organs, where they are called *epithelial* cells; and, as *nerve-cells*, both (1) form the *end-organs* of the sensory nerves in the eye, ear, etc., from which the sensory or ingoing currents take their rise, when stimulated by forces from without; and (2) make up the grey matter of the cord and brain, in which all the nerves of the body take their rise. Bone and muscle are formed by modification of cells; while nails and hair are formed by materials cast out of cells.

Their mode
of communi-
cation.

The nerve-cells of the brain (of which there are over 200 millions in the upper brain alone) send out numerous branching *processes*, or projections of their protoplasm, some of which seem to run on into other cells, and some into nerve-fibres. Indeed, the central axes of nerve-fibres appear to be but prolongations of the protoplasm of the brain-cells, projected outwards, like arms, all through the body. Clusters of cells connected together by their branches in the brain, cord, and organs of sense, are spoken of as *ganglia*.

The branches of the brain cells are very minute and difficult to trace. It has been commonly believed that those of adjacent cells are (some of them at least) continuous with each other, so that forces spread from cell to cell by continuity of substance. Some think, however, that they are not continuous, but communicate only by contact. During mental activity, they think, the cells extend

their branches like feelers, so that they come into contact, and communicate in that way. When activity abates, the branches shrink and contract, and communication ceases, and this is the cause of sleep. This view, however, has been recently called in question and the continuity of the processes re-asserted.

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CHAP. IV.

As to the parts or sets of ganglia composing the cerebro-spinal axis—there are two principal parts, the spinal cord and the brain proper; of which, the latter, though by far the larger and more important in man, would yet appear, from the manner of its development, to be but a prolongation and enlargement of the former.

The parts of the cerebro-spinal axis.

1. The spinal cord or marrow is composed of a grey central core of nerve-cells, receiving and sending out nerve-fibres; and a thick outer layer of white matter, which is found to be composed of the nerve-threads which enter the spine from the body, and, protected by the vertebræ, ascend the spine to the brain. In the lowest vertebrate animals the brain proper is wanting, or minute and undeveloped, and the work of life is kept up by the ganglia, or clusters of cells, contained in the cord.

The spinal cord.

2. The ascending cord or stem enters the skull-bone by a hole beneath, and expands into the *encephalon* or *brain*, which comprises several parts. Thus—

The Brain, comprising—

(1) The stem or cord, after entering the head, thickens for some distance, and is here known as the *medulla oblongata*, or prolongation of the marrow, sending out the nerves which supply the face.

The medulla.

(2) Next, at the bottom of the brain, and clasping the ascending stem from behind by the band of nerve-threads called the *pons* or bridge, is the *cerebellum* or little brain; a two-lobed body, containing in its centre a dense mass of white nerve-fibres from the stem, which spread out like the branches of a tree, and enter into a thick layer of grey cells; which forms the outside, and has its surface in horizontal folds or furrows.

The cerebellum.

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CHAP. IV.The lesser
centres.

(3) Above the cerebellum, the ascending stem has upon it four small ridges called the *corpora quadrigemina*, or four-fold bodies, and between them, a small projection called the *pineal* (or cone-shaped) gland; after which it forks into two branches, and each of these two branches passes through two small bodies called the "lesser grey centres," viz.—

(i). The *thalami optici* or chambers of vision, (one on each of the ascending branches), so called because they receive the optic nerves, and were thought to be the organs of sight;

(ii). And above, and somewhat overlapping the thalami—the *corpora striata*, or striped bodies (one on each side), to which important functions have been ascribed. After passing through these, the ascending branches of the stem spread out, and enter into—

The cerebral
hemispheres.

(4). The *hemispheres of the cerebrum*, or upper brain—the two large lobes of grey matter which line the sides, top, and back of the head, overlapping the cerebellum, and enclosing the lesser centres and the branching stem between them. They are composed of masses of cells, connected with each other by their branches, and embedded in a structureless, semi-liquid material called the *neuroglia*, which is not known to have any other function than that of supporting the cells.

The cortex of
the hemis-
phere

The *cerebral cortex*, or outer layer formed of the hemispheres, in the higher animals, and still more in man, is irregularly furrowed and folded in a peculiar way; and the size of the hemispheres, and the number of these cortical convolutions appear to have some relation to intelligence, because the greater the surface, the greater the number of cortical nerve cells. The two hemispheres are connected with each other, not only by the ascending branches of the stem, but also by masses of nerve-fibres running horizontally from side to side, called commissural or connective nerves.

It is to be observed that all the parts of the brain are double—consisting either of two separate bodies, as the lesser centres, or of two lobes, as the cerebellum and cerebrum. And it is peculiar that the ascending nerve fibres undergo "*decussation*" on the way, *i.e.* they cross

each other from left to right, and from right to left, so that the right side of the body is controlled by the left side of the brain, and the left side by the right.

§ 15. What then is known regarding the *functions or uses of the different materials, and the different organs or ganglia, composing the nerves system?*

(A). *As to the general functions of the materials:* and (a) *as to those of the nerve-fibres*—there can be no doubt that the fibres are merely conductors of influence between the central ganglia, or clusters of cells, and the rest of the body. The influence which runs along the axis of the nerve-fibre is not really a current, but rather a tremor or vibration of the constituent molecules, and has been compared with the electric current; but differs in being slow in comparison, (the speed of the nerve-current being only about 111 feet per second), and in causing consumption of the conducting material. For the nerves, it is well-known, are worn and exhausted by mental work, and require to be continually renewed from the materials of the blood.

(b) *As to those of the nerve-cells*—they are (i) the means of *originating and discharging currents of nerve-force*. It is found that, when currents pass through clusters of cells, they are delayed in transmission, but issue from the other side with increased force, showing that new force has been originated in the cells. And when we put forth effort to move our limbs, the force which flows along the nerve-fibres, and set the muscle-machinery in motion, is originated in, and discharged from the cells of the *motor centres*. Hence the working of these cells must be directly connected with the mental processes of *feeling and volition*, which are the mental springs of action, and direct the outflow of energy in voluntary action.

The force does not, of course, originate from nothing, but is evolved by transformation of the materials—probably the protoplasmic contents—of the cells, which re-

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Function of
nerve fibres.

Functions of
nerve cells.

Those of
originating
force—

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Directing
force—

quire to be constantly replenished from the blood. The need of oxygen and the evolution of heat which takes place in all mental work and effort, indicate that the physical force accompanying it is evolved by a process of oxidation or combustion. And—

(ii) They are the means of *directing nerve-force into the right channels*—i. e. the right lines of nerve-fibre to reach the right muscles and limbs, and produce the right movement; which, again, implies that the processes of the cells are in *direct correspondence with the mental processes of sensation, thinking and desire* which guide and regulate our actions. For a current, once originated, would naturally have a tendency to *diffuse* itself along fibres in all directions, but the cells which originate it have also the property of inhibiting such diffusion, and directing it along the right fibres, in obedience to the guiding idea and desire.

In the case of the simpler and commoner movements indeed (such as those of organic life, i. e. of circulation, digestion, etc. and automatic and habitual actions) this direction of force takes place automatically and unconsciously; but in more complex ones which are under the command of will, it supposes the presence of guiding ideas and thought. Hence, in such cases, the working of the cells must be directly connected with thought. And finally—

And support-
ing thought.

(iii) The cells of the higher ganglia (in man, those of the cortex of the hemispheres) are not only the means of originating, directing, and regulating action of their own, in direct correspondence with thought and will, but also of *inhibiting, i. e. of restraining*, and co-ordinating that of the lower ganglia (*viz.* the lesser centres, cerebellum, medulla and cord), and confining them to action of the right kind and degree, in obedience to thought and will. They are therefore the parts of the organism which are in most direct correlation with mental processes—the “bodily seat of mind,” if such a phrase be legitimate.

Thus, in the healthy system, the higher central ganglia, keep the action of the lower in harmony

with thought and will. In mental disorder, this control is more or less interrupted, and the automatic and disorderly action of the lower ganglia seems to control thought and will, rather than to be controlled by them.

(B) *As to the special functions of the different ganglia or nerve centres* (bodies composed chiefly of nerve-cells)—vivisectional experiments on animals prove at least this much :—

(1) *The grey cellular substance of the cord* is concerned in keeping up the purely automatic processes of organic life—those of circulation, digestion, respiration, and the like ; for these functions continue in animals after communication with the higher ganglia has been cut off.

(2) *The cerebellum* is concerned with the co-ordination of the movements of the muscles and limbs of different sides of the body. For when this organ is removed, an animal can still move its limbs in a random way, but cannot make them work in harmony, so as to walk, swim, or fly.

In man, it regulates also those movements which have first been learnt by exercise of thought, but have because *secondarily automatic* by habit, such as in walking, writing, speaking. These are not instinctive, like the actions of animals, but have to be learnt by exercise of the higher organs of thought ; but having once been learnt, they are relegated to this lower organ, leaving the higher ones free for other work.

The special functions of the lesser grey centres are still uncertain. The optic thalami which, are greatly developed in birds, have been thought to have something to do with vision, and the regulation of the eyes and with turning afferent currents from the body into the right parts of the cerebrum to produce sensation. The striped bodies seem to have something to do with turning motor currents from the cerebrum into the right channels, to reach the right muscles, and produce the right movements.

(3) *The cerebral hemispheres* are, in man, at least, the only parts in direct correlation with the processes

PART II.
CHAP. IV.

Functions of
the different
ganglia.

Of the cord.

Of the cere-
bellum.

Ex

Of the hemis-
pheres.

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CHAP. IV.Localization
of mental
functions in
special brain
centres.Sensory
centres.Motor
centres.

of consciousness. Incoming currents must reach and set up processes in the ganglionic cells of these higher centres, before processes of *sensation* can arise in the mind. *Volition* must occasion processes in the hemispheres, and outgoing currents from them, before it can move the limbs. The processes of *thinking* and *feeling*, which intervene between sensation and volition, must also correspond to processes going on in the cerebrum.

They are therefore, in a certain sense the "organ of mind"—the "seat" of thinking, feeling, and willing—containing the so-called "sensory centres" and the "motor centres." But the attempts which have been made to localize different mental faculties and capacities in particular parts of the cortex—to find a particular seat for colour, sound, memory, hope, ambition and the like—have not been successful. The degree to which all the mental activities are dependent on, and involved in each other—willing in feeling, feeling in thinking, and so on—seems to put all local separation of seat out of the question. Rather the whole cerebrum, or even the whole organism, of which the cerebrum is only the highest centre of co-ordination is the real seat of consciousness. There is some evidence, nevertheless, that—

(1) The posterior regions are specially concerned in the *passive* states of mind, such as sensation; and there are particular parts which seem to be specially connected with particular sensations, as color, taste, smell; though these parts have no definite boundaries, but fade into each gradually—

(2) And that the anterior and lateral parts are more directly connected with the *activities* of the mind, as thinking and willing; and the parts from which the motor currents flow, which move the different limbs and organs, have been determined and mapped out on the front and sides, with considerable certainty.

We often fall into the mistake, however, of speaking of brain as if it were itself all the organization which is needed for the purposes of mind, and the rest of the body had nothing to do with mind. But what really corresponds to consciousness is the moving equilibrium of the forces of the whole organism, continually flowing to and from the co-ordinating centre. The cerebrum is this centre; and consciousness is the awareness of the

continual flux and reflux, adjustment and re-adjustment of forces, and not of the brain. Strictly speaking, therefore, the whole organism and not the brain is the seat of mind.

§ 16. We can now understand somewhat ~~the working of the nervous system~~ as a whole. We now see that external forces, acting on the surface of the body and organs of sense, affect the ends of the sensory nerves contained in them (the protoplasmic cells which they seem always to have at their outer, as well as at their inner extremities), and produce an inward current which, when it reaches the cerebrum, sets up first those processes of the cells which are the physical concomitants of *sensation*; and then, those which accompany *thought* and *feeling*; and, as we never think or feel without also reacting in some way, therefore the processes accompanying thought and feeling are always passing over into those which accompany *effort* and *volition*; and these again, into the outgoing motor currents which enter into the muscles, and there set up alternate contractions, and move the limbs. Limb movements, again, in walking or working, are always producing changes in external things or our position in relation to them, and thereby changing the external forces acting on the sense-organs, and thereby the sensations themselves, and so on.

Thus, passing through the cerebrum, there is an almost continuous *circuit of influence*, from without inwards, and from within outwards—from external things through the sense-organs to the centres of sensation and thought; and from those of thought, again, through volition and muscular contractions, to external things; and those currents which come into immediate correspondence with thought, must pass through the higher centres, *vis.* the hemispheres.

But those currents which have become *secondarily automatic* by repetition and habit, seem to rise no higher than the cerebellum (though still subject to the inhibitive and regulative influence of the cerebrum); while those which have been purely *automatic* from the beginning,

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CHAP. IV.

The working of the nervous system.

Circuits of activity.

The circuit of thought.

Of habit.

Of reflex activity.

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viz. the processes of organic life, (*i. e.* of circulation, digestion, secretion, etc.) seem to rise no higher than the ganglia of the cord.

Hence we may distinguish three circuits of force passing through the nervous centres, and corresponding to different phases or stages of life and mind :—(1) the circle of *reflex* and purely *automatic* action, vital without being mental, passing through the *cord*; (2) that of acquired *habitual* or *customary* actions, which began as mental but have almost ceased to be so, passing through the *cerebellum*; and (3) that of conscious *sensation*, *thought* and *volition*, passing through the *cerebrum*—the last corresponding, therefore, to mind proper.

Dependence
of mind and
body in
health and
disease.

The principle of the correlation or concomitance of mental and organic processes in the working of the brain and nervous system has an important practical *bearing on the conduct of life* with a view to the preservation of mental and bodily health. Health and energy of mind will suppose health and energy of organism—and more especially of the nervous system; and anything tending to impair the one kind of activity will thereby impair the other also. Hence it follows that—

1. Mental excitement and strain may be carried so far that the corresponding physical strain will cause injury to the physical organs concerned, which may be more or less permanent, and impair future mental operations. Hence the effect of mental overwork and excitement in impairing the physical system, and through that, the mind itself, even to the extent of mental derangement.

2. On the other hand, external conditions tending to impair the healthy working of the physical system will thereby impair the working of mind also, *e. g.* insufficient nutrition, impure air, stimulants, and narcotics—the last two being frequent sources of physical, and therefore of mental derangement.

3. But the principle of the *localization* of particular mental functions in particular parts of the cerebrum, if established, would suggest, it has been remarked, a way in which the danger of continuous mental labour might be greatly lessened. If a particular kind of mental work affects mainly a particular department of the brain, then, even when this department is exhausted, the others will remain comparatively fresh. Hence by passing from one kind of mental work to another, the different departments may be exercised in succession without injurious effects to any of them.

This is confirmed, to some extent at least, by the feeling of relief which every one experiences in passing from one kind of mental work to another, e. g. from reading mathematics or philosophy to reading history. This relief may be owing more, indeed, to the fact, that the latter study involves less mental exertion, than that it exercises a different region of the brain. Still there may be a difference of region to some extent in this sense, viz. that the *concrete* ideas of history may involve either a wider or a narrower circle than the *abstract* ones of the former studies. But thought itself is everywhere essentially the same, so that the inner circles connected with different kinds of thought, abstract and concrete, must, for a large part of their area, coincide.

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See

§ 17. Finally, if we are to assume the law of *correlation* or *concomitance* between the two series of mental and physical processes, we have to consider the question. *In what does this correspondence or parallelism consist?* This, to be sure, is a question which belongs to metaphysic as much as to psychology, but still if the psychologist is to assume the principle he is bound to give a definite meaning to it. In the first place, it cannot be a correspondence of *kind* or *resemblance*. We cannot suppose that our sensations and ideas (constructed out of revived sensations) *resemble* in kind either the corresponding brain processes, or the extra-organic thing which causes them. The brain process is always an agitation of molecules, cells, and fibres, undergoing decomposition and recomposition—processes of tension and motion due to chemical and mechanical forces, working in or on the molecules. But the corresponding mental process, the sensation, feeling or idea, has no resemblance of kind to impacts and movements of molecules.

Philosophical question involved—meaning of concomitance.

Not that sensations resemble brain processes

Still less can they have any resemblance to the external *causes* of the brain processes. The pain which makes us aware of a bruise has no resemblance to the lacerated muscle fibres and quivering nerves. Our idea of light has no community of kind with the vibrations of the

Or, their extra-organic causes.

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ether which convey it, nor with the molecular constitution of the object which reflects it, and which we call white.

The older psychologists, such as Locke, admitted that in the case of the secondary qualities such as colour, sound, taste, temperature, our ideas have no resemblance of kind to the external ground; but held that, in the case of the primary ones, such as extension, form, solidity, our ideas are, in some sense, copies of things, as pictures are of their originals. But this would apparently imply that ideas themselves are extended, round or square, hard or soft, and so on. And a more exact analysis shows that ideas of extension, form, and the like, are themselves formed, abstraction and mental construction from sensations (viz. of movement and resistance) and do not differ in their composition from ideas of secondary qualities (though they differ greatly in their meaning). In fine, we cannot say that our ideas of things resemble things, (whether brain processes or their external causes) more than the sounds of a speaker's voice resemble the ideas in his mind, or than printed letters resemble the sounds of the words.

But that there is a correspondence of changes.

But the correspondence is (i) in the first place, a correspondence of change—viz. in the circuit of *phases or stages* through which each of the two series passes. Thus, the physical series begins with a current of force from without, forcing itself into the organs and brain: and this force from without gives rise to a succession of complicate processes in the fibres and cells of the higher centres; and the accumulated force of these finds vent at last in outgoing currents and movements of the limbs. So also the mental circuit begins with sensations which force themselves, so to speak, into consciousness; and there give rise to complicate trains of thoughts and emotions; which finally culminate in volition and effort, the mental counterparts of physical action.

Of quantity.

(ii) It is a correspondence of *quantity*.—Mental states such as sensations, ideas, emotions, have different degrees of quantity or intensity; and their intensity rises and falls proportionately to that of the corresponding physical processes.*

Is the proportion of increase and decrease a direct one? In the case of sensations which are occasioned by extramental forces acting on the organism from without, there are two relations to be considered—the relation of the sensation to the extra-organic stimulating force, and its more immediate relation to the accompanying brain process, which that force causes. (1) In comparison with the extra-organic stimulus, it is known that the mental process increases and diminishes more slowly; for it is found that the stimulus has to be increased in a geometrical ratio in order to increase the sensation in an arithmetical one. (2) But in relation to the brain process, the intensity of the consciousness is held to rise and fall in the same ratio. But this is open to some doubt.

With this is connected the question, whence does the energy of mental work come? It cannot spring out of nothing. Is it produced by transformation of physical brain energy, as one physical force is transformed into another, *e. g.* chemical repulsion into heat, heat into motion of mass, and so on? If so, there would be a decrease in the intensity of brain work while thought is going on; because part of it would be transformed into thought work. It is now generally admitted, however, that there is no disappearance of physical energy in any form from the brain in thought, but rather an increase; so that thought-energy cannot be a transformation of physical.

(iii) Again, it is, a correspondence in *growth* and *development*,—the growth of the mental functions in complexity and efficiency advances *pari passu* with that of the nervous system in the complexity of its parts, and of the processes which they perform.

The brain seems to attain its full bulk about the age of seven or ten; but the number of its cells goes on increasing and communication between them goes on improving by multiplication of connecting fibres, and the different ganglia or groups of cells go on becoming more and more clearly differentiated (implying division of labour, and therefore more efficient performance of work) until late in life. And this multiplication and improved connection of cells is accompanied by increased complexity of ideas and intellectual operations, emotions, and powers and habits of action.

Of development during one's own lifetime.

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Thus the powers of performing complicate series of actions unconsciously or nearly so, which we acquire by practice and call *habits* must be owing to the formation of tracks of communication between certain groups of cells and certain lines of outgoing nerves; such that currents, which at first required the guidance of conscious will, now flow through these channels spontaneously, leaving consciousness free for new and higher work.

Of inheritance from ancestors.

(iv.) And finally, there is a correspondence also in *inheritance*—for in proportion as the power and tendency to perform one of the two parallel series is inherited, the other is inherited also. The power of performing, and tendency to perform the physical series goes with the structure of the brain, nerves, and muscles. Now the physical structure is largely inherited from ancestry; and along with this, the power and tendency is inherited of performing the mental series also. Hence the intellectual powers and emotional temperament of the mind are, to some extent, inherited, innate or intuitive; though it is impossible to determine where the effects of inheritance end, and those of acquisition begin.

Innate powers and tendencies.

For powers and tendencies may be innate though they do not manifest themselves at birth. The development of brain is not complete at birth, but goes on for many years, in obedience to inherited tendencies present from birth; and as brain-structure, and the power and tendency to physical action go on developing in after-life, from inherited tendencies, so the mental powers and tendencies go on developing also; and thus mental powers inherited from ancestors may not really manifest themselves until late in life.

Transition.

Thus the physiological department of psychology deals with the processes (and their organs) which are in most direct correspondence with mental processes. Nevertheless psychology proper is more directly concerned with the mental series itself—with the feelings, thoughts and volitions which make up the so-called stream of consciousness, and constitute mind in the empirical sense, and with the consciousness of self, or of the essential unity pervading and connecting these successive states. Hence the mental series itself has next to be considered. 1-2-05

V. THE MENTAL SERIES.

§ 18. Mind is something which acts, and passes through successive states and processes, and is at the same time *aware* of its acts and states. This awareness of its acts and states is what we call *consciousness*; and the attribute of being conscious of its own states and activities is what distinguishes mind from what is not mind. Other things act and react, and pass through changes of state, but are not conscious of their actions and states. Consciousness therefore (or at least the *potentiality* of consciousness) may be said to be the *essence, primary quality and differential characteristic* of mind—that which makes mind to be mind, and without which it would not be such. And in being conscious of its own states and processes, it manifests and reveals itself to itself; and thereby becomes, at the same time, *conscious of itself* as the *subject* of these states and processes, *i. e.* becomes not only *conscious*, but *self-conscious*. And in being conscious of itself, it may be said to *exist for itself, i. e.* to become self-contained, individual reality. Things which are not aware of themselves exist *for other things* not for themselves, and therefore belong to a lower stage of existence. Mind in becoming conscious of itself has evidently attained to the most complete and perfect kind of existence, becoming relatively self-contained, independent and individual.

Hence mind may be said to contain these component factors—(1) a *subject* of certain activities and states, (2) which is *conscious* of its own activities and states, (3) and therefore also *conscious of itself* as subject of them, thereby realising itself as *individual and personal* reality.

Mind.

Consciousness.

Self-consciousness.

Elements of mind.

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Relation of
mind and
world.

* And as the activity in and through which finite mind becomes aware of itself as mind, must be essentially of the nature of reciprocal activity, or *interaction* with a world of finite things outside of itself, mind may therefore be said to live in an inner circle in the midst of an outer circle—the inner circle being its own states of consciousness, and the outer circle, the world of external things, or nature. The *inner circle* is composed of sensations, ideas, and feelings—the modes of consciousness in which mind realizes itself as mind and becomes conscious of itself, and which is the province of mental science. The *outer circle* is conceived as made up of material molecules and aggregates of molecules, occupying and moving about in space, and is the province of physical science. *As consciousness is the differentiating characteristic of mind, so motion and extension in space is conceived as that of the external world.*

Contrast between them.

Hence mind can be understood as that which feels and thinks, and is aware of itself as feeling and thinking ; in contrast with the external world, or that which is extended and is the object of thought, and is thought about, but does not think. Yet the question, how the distinction between the subjective and the objective, the mental and the non-mental, mind and nature, is to be explained and defined is the most complicate question of both psychology and metaphysic. Thus mind, living within the *inner circle* of its own consciousness—its own sensations, ideas and feelings—can know the *outer circle* of moving and extended things (external nature) only through the medium of, and in terms of certain of its own states of consciousness. It can know the outer world only in so far as it feels itself *affected* by it ; and therefore only as the *external* ground of certain *internal* affections or states of its own. And the states in which it is conscious of itself as affected from without, are its sensations. Thus it can know the world only in its phenomena or effects ; and the effects through which it knows itself are its own sensations.

How the outer world is known.

Hence what seems a paradox is a psychological fact, *viz.* that the external, material world, which seems to us so concrete and real, is to us really an *abstraction*—something abstracted from our own sensations and ideas, and *thought* as existing externally and independently, as the permanent ground of our sensations. This led Berkeley to say that there is no such thing as an external, in the sense of an extra-mental, world. But the fact that we

get our knowledge of it in this way, *viz.* through the medium of what is internal and mental,—as if it were only the *outside* to which our sensations are the *inside*, the *negative* of which they are the *positive*—is not inconsistent with its real existence, nor with our certainty of it.

It would appear from this, however, that the existence of a world outside and independent of our minds is really a *metaphysical* fact,—a fact reached only by an effort of transcendent thought passing beyond the circle of actual consciousness—not a fact of direct experience. Hence the attempts of the most extreme experiential thinkers, (most opposed to the admission of metaphysical ideas) to explain the material world as merely “the aggregate of actual and possible sensations,” or as “the permanent possibility of sensations.” They think in this way to avoid any metaphysical assumption. But this either supposes something external to the individual mind which makes the sensations possible, and which is really the (metaphysical) external world ; or makes it impossible to distinguish between mind and world ; because the sensations themselves are mind.

§ 19. It follows that there are *two aspects under which mind may be regarded—viz.* A. mind as it appears to itself in conscious *experience*, the contents of consciousness ; and B. mind as the *reality* which manifests itself in the phenomena of experience ; in other words, the *experiential* and the *metaphysical* aspects—the actual contents of mental experience, and its metaphysical implications.

A. *Mind may be regarded from the side of conscious experience*—the aspect under which it is regarded by *empirical psychology*. From this point of view it appears as a series of states and processes succeeding and accompanying each other in time—sensations occasioned from without and giving rise to ideas, ideas giving rise to feelings, and feelings again to desires and volitions, and these to feelings of movement ; while movements, again, by changing external things, cause changes of sensation, and so on.

These changing states make up the experience, or conscious life of the mind. And empirical psychology

Known only
metaphysi-
cally.

Mind from
opposite
points of view
—empirical
and metaphy-
sical.

Mind from
empirical
point of view.

Empirical
psychology.

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defines mind as merely the series of conscious states, past, present and future, and undertakes to deal with them as the natural sciences deal with the phenomena of electricity, heat, chemical composition, etc. In other words, it undertakes *viz.* to observe their differences of kind and degree, reduce compounds into their elements, discover the laws according to which they succeed each other in time, and combine together into compounds and aggregates; such study is indispensable because it is necessary to understand the outward manifestations, *viz.* thinking feeling and willing before anything can be understood of the reality which manifests itself in them, *viz.* that which thinks, feels, and wills.

Its necessity.

Dangers of metaphysical psychology.

* To most psychologists hitherto, however, the study of the phenomena of mind, thinking feeling and willing, has derived its chief interest from the light which it casts on the reality underlying the phenomena, *viz.* the soul. But thinkers often allowed foregone assumptions regarding the soul, or substance of mind, too often to warp their judgment with regard to the facts of the phenomena, and thus made an accurate science of psychology impossible. Hence, since Hume exposed these, many have resolved, not only to reject ill-founded assumptions, but to exclude all metaphysical reasoning and conclusions, and limit psychology proper wholly to an analysis of the phenomena of experience. And some have gone so far as to deny the truth of our apparent consciousness of a permanent self which thinks and feels, making the so called *substantial self* or soul to be but an abstract idea, fallaciously substantialized and thought of as a reality. Mind is really nothing more than the series of sensations, feelings, and ideas themselves—"a series which knows itself as past and present." These sensations, ideas, and feelings by themselves constitute the reality of mind as mind, and it has no other. There is, therefore, really no metaphysic of mind, because mind is just what enters into conscious experience, and nothing more.

Reaction against it.

Scepticism and dogmatic Sensationism.

This was given as a possible account of mind by Hume (writing with a sceptical motive merely, *i.e.* a desire of suggesting doubts and difficulties, without asserting anything in earnest); and has been repeated by Mill (though with the admission that it is a "paradox"); but

it has been taken up in earnest by some later writers, who think that all reference to a reality or substance behind the phenomena of mind is unnecessary. It may be called the *sensationist* account of mind, because it makes mind to consist essentially in sensations, original, and revived and recombined in various ways, and therefore to be a passive product of what is non-mental, and therefore without any independent existence of its own.

But the purely sensationist theory either (i) itself involves the fallacy of substantializing abstractions, by making sensations, and feelings (which, apart from the reality which has them, are abstractions) to be themselves substances (as when Mill speaks of feelings as knowing themselves to be past or present); or (ii) assumes the metaphysical theory of materialism, that matter is the real substance which underlies feeling and thinking; so that there is no mental substance, mind being only the series of sensations and feelings, and these being only the functions or products of the organized brain.

§ 20. B. *Mind may be regarded as the reality which manifests itself in the phenomena of conscious experience*—and this the aspect under which it is regarded by *rational psychology*, or *metaphysic* of mind. From this point of view, mind is not merely the series of states of feeling and thinking, but the something which feels, thinks, and wills; because these, like all other phenomena, are phenomena of something—ways in which something shows or manifests itself. But in saying that mind can be thought as substantial reality, it is not meant that it can ever observe or think itself as something existing apart from its states and activities—as something to which the activities may be added on, but to which they are not essential. It cannot think itself except as thinking. It can be conscious of itself only as it manifests itself to itself in some conscious activity.

Now, with regard to mind as substantial reality two questions present themselves. What does consciousness *directly reveal* regarding the nature of the conscious subject? and what is *indirectly implied* (if not directly given)

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Objections
against Sen-
sationism.

Mind regard-
ed as sub-
stance or re-
ality.

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What consciousness reveals about the reality of self?

Self as subject.

in the contents of consciousness regarding it? Of these, the former is a question of empirical, as much as of rational psychology, because it only asks us to analyse what experience directly gives. The latter is rather a question of metaphysical reasoning, because it requires us to go beyond the actual contents of experience. Hence we ask first—

I. What is mind *directly conscious of* regarding its own essential nature, or what are the *revelations of self-consciousness*?

(1) In its *present* activities of thinking, feeling, and willing it reveals itself to itself as the *agent* or *subject* which thinks, feels, and wills. It cannot think of anything without thinking of it as the object of its own thought, and of itself as thinking it; (though it can multiply itself, as it were, in imagination, and think of other selves by analogy—other selves being *ejects*, or reduplications, so to speak, of itself). In other words, consciousness always involves self-consciousness, or awareness of self as what is conscious.

• Some indeed deny this and say that there are many conscious states in which there is no awareness of self—no self-consciousness. Now we do sometimes speak of a person as being “out of his mind,” or as being “lost in amazement and dismay,” and so on; but these are only figures of speech. A feeling would not be our feeling unless we were aware of it as such, and therefore of ourselves as having it. Nor could we afterwards remember it as ours, if we had not originally been conscious of it as ours. The element of self-consciousness, therefore, though it may be faint in degree, can never be absent.

Self as substantial reality.

(2) But further, in reviving and thinking over again *past* sensations, thoughts, and acts, (*i. e.* in remembering), it recognises them as its own, and itself as having been the subject or agent of them in past time; and thereby manifests itself to itself as *something permanent* which has existed continuously through a long series of successive

states and activities, and which by its own identity connects them all together into the unity of a single mind.

This is equivalent to saying that it is conscious of itself as a permanent *individual* or *person*, manifesting itself in a series of activities in time—i. e. of its own *personal identity*, and *substantial reality* (a substance being what remains the same under changes of state)."

* Now, that mind does at least *seem* to be conscious of itself as a permanent reality, is a fact of experience which should be taken into account in experiential psychology, and either admitted, or shown to be an illusion. If this seeming consciousness of personal identity be an illusion, then nothing will be left but the sensationist theory of mind, as being nothing more than the series of feelings and ideas, while that again leads to the materialist theory of substance. Next we ask—

II. What is *implied* (if not directly given) in consciousness and self-consciousness regarding the *entity* or *substance* which manifests itself in the phenomena of consciousness i. e. regarding *ego* or *self* which thinks, feels and wills as substantial reality? This is the problem of *rational psychology*, or *metaphysic* of mind.

In self-consciousness it directly reveals itself to itself merely as an *x*, or something which performs these activities of thinking, feeling, remembering, etc. and which at the same time recognises itself as essentially the same through all these successive activities. The methods of experience can go no further than this. Can the methods of metaphysic go further?

As all thinking consists in comparing one thing with another, therefore thinking the substance of mind will consist in comparing it with whatever other substance there may be, *e.g.* matter; and metaphysic, in attempting to understand mind-substance, must consider the relations in which it necessarily stands to the substance of external nature. Starting from the facts given by consciousness, it differentiates, by abstract reasoning, the various possible

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What metaphysical thought reveals as to the reality of self?

Method of inquiry.

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hypotheses as to the reality or realities underlying mental and physical phenomena ; and considers how far these hypotheses are free from contradictions within themselves, and how far they agree with, and serve to explain the phenomena of experience ; and seeks to determine the one which meets these requirements best.

• Now there appear to be four principal hypotheses ; which may be considered under two heads the *dualistic* and the *monistic* theories :—

Hypothesis of
two sub-
stances,

I. *The Dualistic Theory.*—The theory of the *duality of mind and matter*, or *dualistic spiritualism*, makes mind and matter to be essentially independent realities, neither depending for its existence in any way upon the other, but each capable of existing separately without the other—the two being connected together in man (as *soul* and *body*) only temporarily; and that not by any need or necessity inherent in themselves, but by a force acting on them from without.

Matter as a
substance.

Matter is substance having, for its essence, the attribute of filling, and resisting motion through space, *i. e.* of *extension* and *impenetrability* ; and all its attributes are reducible ultimately to modes of these.

Mind as a
substance.

Mind, on the contrary, is substance whose essential attribute is *consciousness*, and all its known manifestations are modes of consciousness, such as thinking, feeling and willing. But consciousness and extension are *incommensurable* attributes having nothing in common ; a state of consciousness is not extended, and does not resist motion, and a space-filling object, as far as we know, is not conscious.

Applications.

• Thus each substance has its own essential attribute, and is without that of the other ; so that they have nothing in common, beyond the mere fact of their being substances or realities. And being an unextended substance, mind (under this aspect, called *soul*) will be a simple and indivisible entity ; and its “punctual simplicity” may be applied to explain (i) the *unity of self-*

consciousness, the fact that all successive experiences are felt as functions of a single unitary self or subject, and (ii) the *immortality of the soul*, because destruction consists in disintegration, and a simple unit cannot be disintegrated.

This dualistic theory is the commonest view of mind-substance or soul ; but (i) it is difficult to understand how two such incommensurate substances as soul and body, having nothing in common, could have come to be united together as they are ; and (ii) how they could act and react on each other, as they appear to do in sensation and volition—body acting on mind to produce sensation, and mind on body to produce movement (a difficulty which led to the hypotheses of *occasional cause* and *pre-established harmony*). And further, (iii) if the *mental principle* is something attached to the organism from without, it will be different from the *vital principle* which involves and actuates the body from within ; so that we shall have to assume two souls, (1) an *animal soul* to carry on the work of the organism, and (2) a *rational soul* as the thinking subject. Hence :—

II. *The Monistic Theories*—that there are not two fundamental realities or substances but only one, so that the seeming duality of soul and body is only an appearance. These include several forms of theory :—

I. *Materialism* consists in affirming that the only ultimate reality is matter (which exists objectively and absolutely, in all essentials as it appears to the senses) ; and that mind has no substantial reality of its own, but is only the series of conscious states, and these are in some way derived from, and dependent on matter, and have no existence apart from it, being only functions or products of the organized matter of the brain. ✓ As the steam engine produces motion, so the intricate complex of forces in the animal organism produces a total sum of effects, which when concentrated by the mechanism of the brain into a unity, are called mind, soul, thought.

The older materialists supposed that there is a material soul, consisting of a system of atoms of finer quality than other atoms, contained somehow within the brain, and responding by vibrations of extreme rapidity to every

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Difficulties of
dualism.

Hypothesis
of one sub-
stance.

Matter the
only reality.

Older form—
mind and re-
fined sort of
matter.

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Later form—
mind a func-
tion of orga-
nized matter.

Origin of
mind.

Difficulties of
materialism

impression from without ; and that consciousness is the result somehow of their vibrations.

Later materialists think rather that mind is not a product of any special system of atoms within the brain, but a function or resultant of the co-ordinated activity of the brain and organism as a whole. Whenever the brain rises to a certain kind and degree of mechanical and chemical activity, then consciousness in some way results, and goes on, varying in kind and degree as the brain activity varies ; and the "stream of consciousness" thus elicited, constitutes what we call mind.

* Mind, therefore, has no substantial reality of its own, but springs out of the vibrations and disintegrations of the molecules, as a stream of flashes results from the continuous friction of two solid bodies, or the flame of a candle from the rushing together of oxygen and carbon molecules. When the molecular activity sinks below a certain intensity (called the threshold-point), then consciousness fades away—mind ceases to exist—as in sleep. When it rises again to a certain degree, consciousness reappears. It is a purely passive product, and possesses no causality, *i. e.* it does not react on, nor modify in any way, the molecular processes out of which it springs. In other words, the chemical and mechanical processes which produce thought are not themselves affected in any way by the thought which they produce ; but go on automatically according to their own physical laws, and it is the same to them, whether consciousness rises out of them or not. This is spoken of sometimes as the *theory of automatism*.

(i) The great difficulty of materialism is to understand whence the consciousness comes, and whither it goes. It seems to rise out of nothing and sink into nothing again. Does it arise by transformation of any of the physical forces at work in the brain, as one form of physical energy is transformed into another, according to the *law of the conservation of forces* ? But the different physical forces are really different modes of motion, *i. e.* are really molecules and masses moving in different ways ; and transformation of force means movement disappearing in one form, and reappearing in another. Hence, if consciousness were produced by the

transformation of any of these forces—chemical, thermal, electrical—then consciousness also would consist in a mode of motion, *i. e.* would be a distinct and peculiar motion of molecules, different from their other ways of moving. But consciousness is essentially different in kind from any mode of motion.

And further, if any of the physical energies were transformed into thought-energy, then, during thought, a certain amount of activity in the form of motion would disappear, and an equivalent amount would re-appear in the form of thought; so that there would be a reduction of the amount of physical activity in the brain. But it appears to be increased, rather than reduced, in thought and feeling. Indeed the physical forces form a closed circle within which one mode of motion can be transformed into another; but none can pass outside the circle, and be transformed into anything else. Therefore it is impossible that thought can be produced by any transformation of physical energy.

(ii) Again, materialism makes it impossible to explain the *unity* of self-consciousness. The brain is composed of innumerable atoms and molecules, millions of cells, and thousands of ganglia, all undergoing incessant disintegration and recomposition, leaving nothing that is one and permanent. How then can the action of such a multiplicity of parts be conceived to produce that focal unity of consciousness, which is essential to mind, in which every state and process is felt as the function of a single permanent self?

(iii) Finally, materialism involves a logical paralogism. Organism and brain are known only as *external phenomena*, *i. e.* only through and in terms of our own sensations, which are themselves processes of mind. And, in thinking of matter as *objective* (extra-mental) reality mind is *abstracting* from itself, *projecting*, and ascribing *objective reality* to an idea which it has itself constructed. Hence matter as conceived by mind is, in a sense, a product of mind. Therefore matter has to be explained and accounted for by means of mind; and not mind by means of matter. Thus, as a psychologist, the materialist is obliged to explain matter by means of mind (by sensation, construction, abstraction, objectification); but again, as a metaphysician, he turns round, and tries to explain mind by means of matter; and is guilty, therefore, of the vicious circle in reasoning.

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Motion can not be changed into thought—the physical forces a closed circle.

No diminution of physical activity during thought.

Cerebral activity can not account for unity of mind.

Paralogism involved.

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Mind and
matter as as-
pects of one
substance.

* Hence, though the processes of organism and brain are undoubtedly instrumental to thought—though it is through them in some way that mind realizes itself as a self-conscious factor of the world-system—yet no molecule, nor cell, nor ganglion, nor brain as a whole, can be regarded as itself the *thinking principle*, the *agent*, or ultimate *reality* which thinks, feels, and wills.

2. *Universal parallelism*—the view, worked out theoretically by the philosopher Benedict Spinoza, of one substance with two sides or aspects, and of mind and body as, not two substances, but only correlative aspects internal and external—or positive and negative poles—of one and the same substantial reality. Thus, as the spoken proposition is a series of sounds, and the written one, a series of visual forms, and there is no resemblance or community of kind between them; and yet they both correspond to, and express one process of thought in the minds—so, in the world, the one absolute reality expresses itself in two parallel series of phenomena, mental and material.

Thus, there is but one substance or ultimate reality, and it is by itself, in the abstract, neither mind nor matter. But substance is nothing without attributes; and the ultimate substance has two fundamental attributes, correlative to each other, which may be spoken of figuratively as two sides or aspects, inner and outer, of the same thing.

The world of
nature and
world of
mind.

* From one point of view, reality appears under the form of extension, i. e. as a plurality of units existing external to each other, under the changing relations of space. From the other, it appears as units and relations of consciousness of idea, corresponding inwardly to the outward forms and relations of extension. For every unit and change of extension, there is a unit and change of consciousness. And as, externally, many units or *quanta* of extension coalesce together into larger wholes, constituting organs and organisms; so, internally, the corresponding *quanta* of consciousness coalesce into ideas and organized systems of ideas, constituting minds. And as all the forms of extension coalesce together so as to constitute the organism of all organisms, viz. nature as a whole; so all the cor-

responding forms of consciousness, and aggregates of consciousness constituting finite minds, fuse together into one universal consciousness, or idea of all ideas, *viz.* God.

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Hence mind and body are two aspects of the same reality. Inwardly, the individual appears to himself in his own consciousness, as a connected series and system of feelings and ideas, *i. e.* as mind. Outwardly, to others (and to himself when reflected from without) he appears as a connected aggregate and system of extended parts, *i. e.* as body.

This theory of a single "double-faced reality," of which mind and body are the internal and external aspects (or positive and negative poles as some have expressed it) has recently been revived and adopted by Bain, Spencer, Wundt, Höffding, and many others, and held to be the metaphysical theory most consistent with the results of experimental investigation. It explains the axiom of empirical psychology—the Law of Correlation, that "for every mental state and process there is a state and process of the material organism"; and enables this proposition to be converted and generalized into "for every material state and process in the world there is a corresponding mental one"—if not in any finite individual, yet at least in universal mind. And it obviates the difficulty of explaining the origin of mind which weighs on both dualistic spiritualism and materialism, by making it to be necessary as a correlative pole or factor in the essence of the absolute reality, and therefore present in some form universally.

Favourite
theory at the
present day.

Nevertheless, when closely examined, it is found to involve difficulties. It is difficult to explain mind and matter as merely parallel, and on the same level with each other. Rather one must be conceived as propelling or leading, and the other as resultant, product, or instrument. Thus parallelism is always either falling back into materialism, giving the leadership to matter; or moving forward into idealism, giving priority and leadership to something mental. And if there be a contradiction in conceiving matter as something non-mental and yet as producing mind, as materialism does, there it becomes necessary to consider whether mental power may not be conceived as evolving the world of nature by its own energy, and using it as the material of its own thought, and as the means of realizing itself as self-conscious mind. Hence—

Difficulties.

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Mind the ultimate reality.

3. *Idealism*—according to which the ultimate reality is an energy which is mental in the sense, at least, that it is essentially a striving to become mind, i.e. to become aware of itself as self-conscious spirit; and in this striving evolves the world of nature as the material of its thought; and through nature and organization, realizes itself at last as self-conscious mind—both as finite minds which evolve, and become conscious of themselves in and through finite organisms; and as universal mind which becomes conscious of itself as the universal creative energy evolving and containing all finite things and minds within it. This system may be called *idealism*, because it makes the world-process to be the realizing of an *idea* or *end*.

This *monistic spiritualism* may be said to make mind both the *beginning* and the *end* of the world-process. It has its beginning as energy, impulse, or *will to be*; and its end as *completed, perfected, fully realized reality, viz. self-conscious spirit*, reality which has become *real to and for itself*, reality in the highest sense.

Contrast with other theories.

• According to this view, body is not something which precedes, and is indifferent to, but accidentally gives rise to mind—casts it off as a collateral, inessential result, as the grating solids cast off the stream of sparks (materialism). Nor is the soul or mental substance something extraneous and indifferent to body, and inserted into from without (dualistic spiritualism). Body is the system of means which the mental power evolves and organizes for itself, in order, through it, to perfect itself as concrete, conscious, self-contained, individual mind. And it has the advantage over the Spinozist duality of corresponding aspects, in that it vindicates the primacy of mind over matter, making mind to be both the *energy* or *striving* (viz. as *will*), and the *end* towards which it strives (viz. as *self-conscious spirit*); and matter to be the intermediate *means through which* it strives to attain its end.

Advantages.

This theory of *idealism* or *monistic spiritualism*—which was implied in Plato and Aristotle, but was first clearly stated by Berkeley, and worked out with most

logical rigour by Hegel—does not commend itself to purely experimental investigators so much as the Spinozist hypothesis, but accords better with the prevailing philosophy of evolution. It avoids some of the difficulties involved in dualism, ~~Thus (i) it obviates the need of assuming two souls—an animal soul as vital principal to animate the organism, and a rational soul as thinking principle—because, according to it, the principle which evolves the body is also that which rises into self-consciousness as mind. And it obviates (ii) the difficulty—how, if matter and mind be incommensurable substances having nothing in common, the material world can be perceived and comprehended by mind. For according to it, the conception of the world which thought constructs within the mind, will be a reproduction, in terms of finite mind, of what has been produced already by infinite mind. The finite mind finds itself at home in nature,—finds laws and processes which it can comprehend—because nature has already passed through mind, and its forms and laws are products of mind-power.~~

CONSCIOUSNESS.

§ 21. Having considered the chief questions concerning mind in general, we have next to consider the attribute or primary quality which makes mind to be mind, *viz.*, its attribute of being conscious of its own states and activities. Under this head we may consider first the distinguishing characteristics of consciousness, then its contents or elements, and especially the object or element of reality given in it, and then the conditions on which it depends.

I. With regard to the nature of consciousness, however, nothing more can be said than that it is the mind's property of becoming aware of itself and of its own activities and changing states, and is what makes mind to be mind, and differentiates it from whatever non-mental forms of being there may be.

Definition or
description.

No definition, indeed, can be given of consciousness, which is not synonymous; because it is an ultimate fact, which cannot be brought under any higher genus, and can be known only by being experienced. We may say

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indeed that it is *the self's awareness of itself and its own changing states*, but being aware is only a synonym for being *conscious*.

• (1) But though it cannot be *defined* it can be *described* in various ways, *e.g.* by enumerating its *constituent factors or elements*, *viz.* effort or conation, feeling, and thinking, and explaining their relation to each other.

(2) By showing that it is the common essence of all mental states, and that which makes them to be mental, (as sensation, *e.g.* perception, memory, reasoning, desiring, willing, differ from each other *specifically*, but are *generically* identical in being conscious processes, and therefore mental).

(3) By contrasting the mind's differentiating attribute of being conscious with what is thought to be the differentiating attribute of non-mental things, *viz. extension*, or the property of filling space.* Thus external phenomena (*viz.* sensations) seem to imply an external world, which fills space and resists movement through it. But the mental attribute of being conscious has nothing in common with the material attribute of filling space, and implies that the mental principle is without the latter attribute. (This suggests, of course, the great problem of the metaphysical schools—how two such incommensurable substances, extended and unextended, can interact upon, and thereby correspond with each other as they appear to do).

Elements or
contents.

II. Next as to the *contents or elements of which consciousness is made up*,—it will be found that consciousness is always a consciousness of three correlative elements which support each other reciprocally in such a way that none of them is possible without the others. Thus:—

Striving.

(i) It is always a consciousness of *striving, effort, activity*, because the life of the self is a continual striving to preserve and perfect itself in interaction with the surrounding world—a consciousness of *conation*—in its higher forms called *willing*.

Feeling.

(ii) It is a consciousness of agreeable or disagreeable *sensibility* or *affection*, arising from the different ways in which the self is *affected* by the surrounding

world and its own continual effort of self-preservation—a consciousness of *feeling*.

(iii) A consciousness of *reality* or *realities* underlying and manifested in and through these elements of activity and feeling—in other words a consciousness of *cognition, knowing, thinking*.

Thus these three correlative factors—the awareness of *effort*, of *feeling* and of *knowing*—make up, by their co-operation, so to speak, one concrete state of consciousness.

• For we see that the self, in order to be conscious, must be in a state of incessant effort and activity, because an absolutely inert thing, even if such a thing could exist at all, could have no consciousness of its existence. Activity and consequent change of state are the *medium*, so to speak, in and through which the self can rise into feeling; and thereby to awareness of itself as feeling subject, and of other things as contrasted with itself. ~~Without effort and consequent change of state there would be nothing to enter into consciousness.~~ And further, the self, as a finite being, can preserve itself in existence only by incessant interaction with other finite things.

The element of feeling, again, has the quality of being agreeable or disagreeable, pleasurable or painful desirable or undesirable, according to the way in which the self is affected by its environment; and thereby supplies to the self a continual motive for effort and activity, viz. to prolong or attain to agreeable, and escape from disagreeable states.

III. Next as to *the object of consciousness*.—Consciousness includes, we have found, an element of knowing, and therefore something known—an object.

For acting and feeling are only processes (and therefore by themselves only abstractions); and we cannot be conscious of them without being conscious of concrete reality underlying and giving rise to them; and this is what we mean by saying that there is a factor of cognition contained in all consciousness. What is it then that is known in all consciousness?

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Knowing.

The reason
of this.

See.

The object.

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Primary, the
self.

The object seems to be two-fold—to be in fact two objects in correlation with each other. For:—

(i) The *primary object* cognised in consciousness is evidently the subject itself which is conscious. The subject *acts* and thereby changes its states, *feels* these changing states, and in so doing *cognizes* itself as the subject of them.

• The conation or effort, the feeling of changing state, and the cognition of self as acting and feeling, are, like the three sides of the triangle, factors of one and the same process. For while all other activity passes outwards, so to speak, upon other things, consciousness is essentially *reflection*, or a turning backwards of the subject upon itself—a feeling, pleasurable or painful, of its changing states, and, in and through the feeling, a cognition of itself as the subject of them. Hence all consciousness is fundamentally and essentially *self-consciousness*. Its *primary* object, at least, is the self which is conscious.

For if the self did not directly know itself as a reality, it could not go outside of itself to discover reality elsewhere, and therefore could never know reality at all. Whatever notion it has of substantiality and reality, it must derive from itself. In self-consciousness subject and object must be identical.

✦ The relation of these three factors of consciousness may be understood somewhat in this way. The self or ego, as a finite conditioned being, can exist and preserve its existence only by interaction with other finite things. Its existence is a continual process of adjustment and readjustment of itself to present and future circumstances, and, therefore, of incessant activity and change. Out of its changing states spring the feelings of comfort or discomfort, satisfaction or dissatisfaction, pleasure or pain, which form the groundwork, so to speak, of its consciousness. And in and through its feeling of its own changing states, it becomes cognizant of itself as the subject of them (and of a not-self also as the cause of them). Thus we can see how these three factors of *activity* (*conation* or *volition*), *feeling*, and *knowing* or *thinking*, must enter as correlative conditions into every process of consciousness.

Secondary,
the not-self.

(ii) But there seems to be a *secondary-object* present in elementary consciousness.—We are conscious of ourselves

not only as thinking, but also as thinking something other than self. In being conscious of self, we are also aware of a not-self, or surrounding world in opposition to, and in contrast with self.

* We can see two reasons why this secondary object must enter in some way into all consciousness: (1) The self cannot be conscious without being excited to conscious activity by something other than itself, and ~~there can be no activity without something to act upon~~; and (2) by the law of relativity, it can be conscious of self only in contrast with something other than self. We say, therefore that ~~self-consciousness is always accompanied by other-consciousness—perception of internal reality by perception of external.~~ But whether these two objects of consciousness, and the cognitions of them—internal and external perception—are on exactly the same level is a question of difficulty.

Thus we find that consciousness is fundamentally consciousness of self and its changing states, for if the ego were not cognisant in the first instance of itself, it could hardly go out of itself, to become cognisant of anything else. But consciousness depends so much on relation and contrast that it may be questioned whether it could know itself except in contrast with a not-self, *i. e.* without knowing not-self at one and the same time with itself. Hence it would appear that *self-cognition* and *other-cognition*, or cognition of an external world, are inseparable correlatives, contained in one and the same original process of consciousness. Hence if consciousness have the self or subject as its primary object, it must at the same time have a secondary object, *viz.* the not-self or external world, as the necessary contrast and correlative of the self, without which it could not be thought. We may speak therefore of being conscious of external things in the same sense as of self. This is maintained by Hamilton as part of his theory of external perception.

* IV. We have next to consider *the conditions on which the origination and continuation of consciousness depend*, so far as known.

Conditions

(A) These, however, will be partly *metaphysical*—consisting in the nature of the mental principle as substantial reality, and in its relation to other realities—which is the subject of metaphysic, rising into philosophy.

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• Thus it seems to imply a mental principle as a permanent substantial centre of activity which maintains its own existence by interaction with the rest of the world, and possesses at the same time the attribute of becoming conscious of its own activities and changing states, and thereby of itself and its own place in the world-system. The nature of the self as substance, however, is a question of metaphysic and philosophy, which asks the questions: What must the self be in order that it may know the world, and what must the world be that it may be known by the self?

(B) Partly also physiological, if we admit the dependence of mind to any extent on body. Regarded from this point of view, the conditions of consciousness, so far as we know them, seem to include a bodily organism in interaction with an extra-organic physical world; and a system of nerves and central ganglia to co-ordinate the processes of the organism, bringing them, as it were, to a focal point, and making possible the unity which consciousness supposes, and the correspondence between mental and bodily states.

• It is certain also that the higher and more complicated series and combinations of conscious states, in the more highly endowed beings as compared with the less endowed, are concomitant with more highly differentiated brains and nervous systems.

Law of the
Relativity
of conscious
ness.

(C) But it has conditions also which are purely psychological, and require special consideration in psychology. States of consciousness depend largely, for both their quality and their intensity, upon other conscious states. This dependence of mental states on each other is expressed in the *Law of the Relativity of Consciousness*—that consciousness consists essentially in a distinguishing of differences, agreements, and connections between things, i.e. of relations, and that therefore *there can be no consciousness where there is not a plurality of distinct states and objects, which can be discriminated as different from each other.*

Consciousness dependent on plurality and change of state.

1. In the first place, relativity is a condition of the very possibility of consciousness in this sense* that consciousness consists in a discriminating and distinguishing of the states and activities of the self, as different from each other in quality and degree; so that, if *there were not continual changes of activity and state, there could be no consciousness*. "To feel always the same thing," Hobbes says, "is equivalent to not feeling at all." A perfectly uniform, unchanging field of consciousness would be a blank. The state A by itself would give no feeling, nor B by itself; but when A and B are presented together, or in close succession, then the consciousness of both starts forth. * Creatures living in perpetual darkness have no consciousness of darkness, as the animals in the mammoth cave of Kentucky, whose eyes have even become atrophied with disuse. *

* From this it follows that the chief psychological condition of consciousness is continual change in its materials and objects, i.e. in the states and activities of the self, and in the external things which occasion them. The more monotonously the same objects are kept before the mind the fainter does the consciousness of them become, till it reaches the vanishing point. The effect of uniformity in diminishing, and of change and contrast in deepening the feeling is illustrated in the universal striving after novelty—for new employments and amusements, new surroundings, new knowledge, and even new political and social institutions.

2. And relativity is held to be a condition of the possibility of consciousness in another sense also.* *The self can know itself only by contrast with a not-self; the subject can be known only in relation to an object*. * Consciousness springs out of the relation and interaction of the two. A self can become conscious of itself only in so far as it is limited, resisted, acted on, by a not-self, external to itself.

On opposition of self and not self.

* This form of the law has been used in philosophy by "relativists" to prove the impossibility of a universal

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or absolute consciousness (a personal God), on the ground that an absolute being would have no other being outside of itself to resist it, and thereby to be the external object—the not self—which is indispensable to consciousness. Hence only finite beings, they say, can have consciousness. But this form of the law really rises out of the first form. The self's consciousness is its awareness of its own changing activities and states; and these in the finite ego are caused by its interaction with the other finite things which limit it, and against which it has to preserve itself by external action and reaction; and this is the only reason why an external object is necessary. But if the ego were an absolute being, and evolved its activities and states from within itself, unconstrained by anything external, there would be no reason why it should not be conscious of them all the same, viz., by their differences and contrasts among themselves without any external object.

On structure
of organs.

3. And as the possibility of consciousness depends on relativity in the above two senses, so the kind or quality of it depends on relativity in another sense. The kind of consciousness which things occasion in us is dependent on (relative to) the structure of the organ through which they affect us. Now external things affect us through our sense-organs, and the kind of sensation which they give us depends on the structure of the sense-organs. One organ gives rise to smell, another to taste, another to colour. And other beings having differently constructed organs, would get different sensations from things; so that their knowledge of the world would be entirely different from ours. Hence consciousness and knowledge are relative to organization and may be entirely different in kind in differently organized beings.

On comparison
and judgment.

4. And as the possibility and quality of consciousness depend on relativity in the above three senses, so its *degree or quantity* depends on it, to some extent at least, in a fourth sense. This fourth sense of relativity gives what is called the *relativity of our judgments* of things. In all judgments of things, there is a comparison between one thing and another, and the judgment

of a thing depends largely on the thing with which it is compared—the standard of comparison. Thus a tall man gives a stronger impression of his height when beside a short one; a moderate heat seems excessive to one who has come from a cold climate, and so on. Thus the intensity of sensations, the pitch of sounds, degrees of illumination, and the like, depend, for the effect which they produce in consciousness, upon contrast with other impressions of the same kind. So our sense of the beauty of a thing, and goodness of a person, is heightened by contrast with their opposites.

* Some writers, indeed have made so much use of this principle that they have been called "relativists," *e.g.* Bain and Spencer. "We do not know any one thing by itself," Bain says, "but only the difference between two." This would mean that we are conscious only of the joint effect which they produce in the mind, and not of either of them separately. And this has been used to disprove the possibility of any real knowledge of either mind or matter; because consciousness, it is said, is the joint product of the two, and it is impossible to determine the exact contribution of either.

Relativism.

This, however, must not be carried so far as relativists have sometimes carried it, *e.g.* so far as to say that no uniformity is possible in judgments of quality, quantity, beauty, or goodness—that they are wholly relative and dependent on circumstances, and that "the man is the measure of all things."

This exaggeration of the effects of relativity would evidently reduce mind to mere sensation and feeling, and leave no such thing as knowledge. But how could we know relations, or joint effects of relations, to be such without knowing their terms? When we look at the colours, red, yellow, blue, the difference between them enhances the sensations which they give; but we are conscious of the colours as well as the differences, for the differences themselves would not be red, yellow nor blue.

§ 22. A question has been raised with regard to the element of feeling (sensation or emotion) which enters into every process of consciousness—whether it is

Is feeling
simple or
compound?

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absolutely *simple* and *ultimate*, or is a *compound* of *elementary units of feeling fused together, so to speak, into one mass.*

A state of sensation or feeling seems indeed to be simple and uncompounded, but Spencer and others think that every one is produced by the coalescence or fusion of many elementary "shocks" of feeling; which might under certain circumstances, be felt separately, but which in ordinary cases run together, and are felt as a compound; so that, though the units are not felt separately, yet they determine the quality and intensity of the compound. Thus, a musical sound is produced by many thousands of air waves and beats on the tympanum, but these fuse together into one sensation. The distant forest presents only a patch of green to the unaided eye, but when a telescope is used, many trees and waving branches are revealed. These must all have reached the mind separately, otherwise the telescope could not have shown them separately.

Thus, as physical objects are composed of atoms of matter, so consciousness is made up by the coalescence of "shocks" or "units" of feeling; and thus the atomic theory is extended to mind. These units have been spoken of as "mind stuff," or as "mind dust," and also as being *subconscious*, i.e. conscious, but too faintly to be distinguishable, and therefore lost in the compound. This view suggests the opinion of Leibnitz, that the mental principle receives and retains infinitesimal modifications, though only compounds of them rise into clear consciousness. It agrees closely also with the Spinozist theory of the origin of mind by amalgamation of many modes or units of idea.

Others think, however, that the elementary "shocks" or "pulses" are not units of feeling, but merely *successive waves of nerve force*; which do not reach mind separately, but combine in one resultant process or state of brain; and that it is this one resultant brain process that directly gives rise to the feeling, and not the separate "shocks." Hence the feeling itself is really simple and uncompounded.

• But many psychologists ascribe more work to the brain than it is capable of performing—work which is impossible in terms of molecules and molecular motions. Besides, there can be no such thing as a simple brain state; every one is inconceivably complex; and if feeling corresponded directly to brain, it would be complex also. According to the theory of *unconscious mental modifications*, the “shocks” or minute impressions are really mental (and not cerebral merely), but unconscious.

§ 23. Of more importance is the question of the *relation of consciousness to mind in general*. It was stated above that the essence of mind, or what makes mind to be mind, is consciousness actual or *potential*. But can there be mind in which consciousness is only *potential*, as we assumed? If so, the psychologist may assume that part of the work of mind is performed unconsciously, or as *subconscious mental activity*. Or are mind and consciousness, as many maintain, identical and co-extensive; so that mind is mind only in so far as it is actually conscious, and ceases to exist when consciousness ceases? If so, whatever goes on beneath the threshold of consciousness will be outside of mind altogether. This question has important bearings both in psychology and philosophy.

Are mind and consciousness co-extensive?

• There are three hypotheses bearing on this question:—

(1) According to the *materialistic metaphysic*, mind being only an occasional product of matter, is identical with the series of conscious states, and ceases to exist when these cease (as in sleep), and comes into existence again, when these reappear. What remains in the interval is merely states and processes of brain; and knowledge (ideas) when not present in consciousness, is preserved as vibrations or arrangements of brain cells and molecules. Out of consciousness is out of mind. The system called sensationism also identifies mind with the series of states (Mill), but avoids any metaphysical explanation of them.

Materialist answer.

(2) The *Spinozist system* also makes mind and consciousness to be co-extensive and identical, but it is in

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CHAP. V.Mental and
physical
universally
concomitant.Sub-cons-
cious mental
activity.

the sense that they are correlative and universal, so that neither is a product of the other. *Every quantum* and *modification* of extension in universal nature corresponds to a *quantum* and modification of idea in universal mind; so that what is out of the individual mind is not out of all mind. And the individual mind does not spring out of nothing but is formed by the coalescence of many units of consciousness into one organised system, or "consciousness of many units of consciousness," corresponding to the organised system of space-forms which constitutes the body.

(3) Finally, the theory of *unconscious mental modifications* maintains that mind and mental activity are subject to degree and order; and that consciousness, though *implicit* and *potential* in all mental activity, can become actual only when a certain *degree* and a certain *order* or *organisation* of activities is attained. (Mental activity—ideation or the working of ideas—may sink below the "threshold," or liminal intensity, without thereby ceasing to be mental. In fact, the greater part of the work of mind is carried on below the threshold of consciousness, and conscious mental life is the product or resultant of what goes on unconsciously. States of actual consciousness are like the tops of the waves rising into the sun-light, while the currents which produce them flow on in darkness below. Mind, Leibnitz says, is subject to infinitesimal modifications, and retains them in its constitution, but it is only their compound effects that rise into consciousness.

This view was stated by Leibnitz and applied more recently by Hamilton and Hartmann on philosophical grounds. It is certain that great part of the work which we call mental, e. g. the preservation and revival of past experiences in the form of memory, the constructions of imagination, and great part of our reasoning (as in calculation), are carried on unconsciously; and that our conscious mental work is only results and fragments of work not actually conscious. And there is much difficulty in assuming that the unconscious work out of which consciousness springs, is only molecular brain work—not "unconscious *ideation*" but "unconscious *cerebration*"—and that mind springs out of nothing and sinks back into it again, every time we sleep and wake, as materialism assumes.

Yet it is opposed by most recent psychologists on the ground that *unconscious thought* is a contradiction in

It is a contra-
diction.

terms. Unconscious *feeling* would certainly be a contradiction; but it is not feeling, but *ideation*, or the working of ideas, that is said to go on to some extent unconsciously; and we are not sure that *idea* is not something more than the *consciousness* of idea—something that may sink below the level of consciousness, but still be mental, and not a mere modification of brain.

And without some such explanation, it is difficult to understand the unity and connection of mental life. For conscious life is only a series of fragments—mere *disjecta membra* of mind—and it is hard to understand what gives them the connection and unity which they have, unless it be a continuous *subliminal* activity of the mental principle itself. The tendency to explain everything by imaginary brain processes may be carried too far. Molecules and their combinations and disintegrations cannot be made to account for the unity of conscious life.

This subliminal mental activity is better expressed, perhaps, by calling it subconscious, rather than unconscious,—the meaning being that such activity, though not distinctly conscious at the time, yet makes itself felt by its effects on the collective consciousness afterwards.

SELF-CONSCIOUSNESS.

§ 24. We now understand that in being conscious of effort, feeling and thinking, we are at the same time conscious of the effort and feeling as *ours*, and therefore of *ourselves*, as that which strives and feels and thinks. This is equivalent to saying that all consciousness includes self-consciousness.

In other words, in addition to the conscious activity by which the self asserts and preserves its own existence in interaction with the surrounding world, and the passive feeling or sensation which rises out of the ways in which it is affected by this interaction, consciousness includes also a cognition of the reality of which activity and feeling are manifestations; and the fundamental reality cognized in consciousness is the self, viz., as the subject of the activity and feeling.

What it is
and how it
arises?

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Its philosophical importance.

* This fundamental cognition of the self is of the utmost importance, because the self is the one reality of which we can be said to be immediately aware. (For the not-self is given only as the *occasion* of conscious states and activities, so that the consciousness of it can hardly be said to be immediate in the same sense as that of the *subject* of them). The self therefore is the source of the idea, and to us the original type of all reality.

We have to consider still further (§ 20), what consciousness *reveals* directly regarding the self and then the attempts which are made to *refute* what common-sense has always taken to be the revelation of self-consciousness. Hence—

I. As to what *conscious experience directly reveals concerning the self*—All consciousness is, we have found, essentially a process of *reflection or turning back* of the agent upon itself (in contrast to other activity which passes outwards so to speak, upon other things); so that the sphere of *immediate* consciousness is an *inner circle* (the knowledge of which is *intuitive*), to which the rest of the world is an *outer circle*, (the knowledge of which is relatively *mediate*).

1. Now in every complete process of consciousness—in perceiving, remembering, reasoning desiring—along with the *activity* and the *feeling* of the changes of state resulting from it, there is contained also a direct cognition of something which is the *agent* or *subject* of the process, and is the fundamental condition which makes it possible—a something which acts and feels, perceives, remembers, reasons,—a self or ego. There is no awareness of the changing states without awareness of the self or subject of which they are the states, nor of the self or subject apart from the changing states; but only of the two together, and in mutual correlation, as one concrete reality.

* For this there are two reasons:—(i) *Feeling or sensibility* is not a substance, or what can subsist by

The revelations of self-consciousness.

What present consciousness reveals concerning the self—self as subject.

itself; but only a state, process, function of something, and therefore apart from its subject, would be only an abstraction equal to nothing. Those writers who speak of sensations and feelings as feeling and knowing each other, or of self as nothing more than the sum of the feelings, are *substantializing abstractions*. The cognition of the subject must be distinctly present wherever feeling is distinct. * We can think, indeed, of feeling in general, and of feeling as felt by other persons; but this is by a process of analogy involving imagination and inference. All feeling is *primarily* feeling of self. And (ii) a self or subject apart from the activities and states in which it manifests itself, would be substance without quality, which is equal to nothing. The concrete reality is the two in correlation.

2. Again, in recalling or reproducing the states and processes (experiences) of past life in memory, (*i.e.* in the form of ideas,) the activity of recalling is itself an activity of the self, and experiences recalled are *recognized* as past experiences of the same self (or more strictly, the present ideas are recognized as *representations* or *reproductions* of past experiences of the self). Thus past and present experiences are felt as one continuous system of states and activities in time, constituting the self-manifestation or mental life of a single self.

The self thus recognises itself in its consciousness as *a single permanent principle manifesting itself to itself in a connected system of states and activities in time, and remaining one and the same identical principle through all successive states, and connecting them all together into the unity of a single mental life.* * This consciousness by the self of its own identity as the subject of a connected system of experience in time, is called the *consciousness of personal identity*.

* We can understand this better if we reflect that an activity and state is possible only in connection with other antecedent ones in a series or system connected by casuality; so that the self could not feel itself the subject of one, without feeling itself the subject also of the whole series as connected factors of one life,

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No feeling
without a self
which feels.

No self with-
out a state of
feeling.

What memo-
ry reveals
concerning
the self—self
as permanent
subject.

Personal
identity. ?

Mental life as
one whole.

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Attempts to deny the reality and permanence of the self.

Facts telling against it—multiple personality.

and recognising itself as the unifying principle of the whole. (Hence Kant^o thought that the successive actions of a life-time are but phenomenal manifestations in time of a single transcendental act, forming the metaphysical essence of the self above time).

II. Nevertheless, attempts are made to deny the validity of *this apparent consciousness of the essential unity and identity* of the mental principle. It must be admitted that in the experiences which make up what we call self-consciousness—we at least *appear* to ourselves to be conscious of our own reality and permanent identity. The question may be raised, however, whether this apparent consciousness of personal continuity is real or not, *i.e.* whether the idea and belief which experience thus leads us to form of the self as permanent and substantial reality correspond to actual reality, or is only an illusion.

• For if the series of past experiences is interrupted by loss of memory as sometimes happens, then the subject ceases to be aware of its own identity in the past, and enters on what is, to its own self-consciousness, a new life. There are also cases of “*alternating personality*,” in which an individual loses memory of the past, and enters for a time on a new life, but at last forgets that new life and recovers the old one. And there have been cases of repeated alternation from the one to the other without any amalgamation of the two. And cases have been known of a person remembering his own past experiences but regarding them down to a certain point, as not his own experiences, but those of another person. Self-consciousness therefore is only an illusion, it is said.

But if it is only an illusion, how does the illusion arise? The treatment of this question involves both metaphysical and psychological considerations. Sensationism and materialism agree in holding that the *apparent consciousness of the substantial reality and identity of the self* is an illusion.

1. *Sensationism* says that mind is nothing more than the *series of conscious states*, and the self is only

the series so far as it is preserved in memory. The self may, therefore, be reduced in content by loss of memory, or even divided into two or more by interruptions of memory. The word soul is simply a name for the series of mental phenomena which make up the individual mind. No reference to a permanent, substantial unifying principle is necessary. But how are we to account, then, for the apparent consciousness of self as unity and reality? If it is only an illusion, how does the illusion arise? The sensationist explanations of this involve the fallacy of substantializing abstractions. Having abolished other substance, they make feelings themselves to be substance.

• (1) Mill suggests (though only as a "paradox") that the "series of feelings may be aware of itself as a series." The series as a whole, therefore, will be conscious of its successive constituents as constituents of itself. But how can that which is a plurality be conscious of itself as a *one*? The very possibility of connected consciousness, and of memory and expectation, supposes the unity of the conscious subject. And, indeed, the last statement on the subject by Mill himself was that "there is a bond of some sort among all the parts of the series which makes us say that they were the feelings of the same person throughout, and this bond to me constitutes my ego" (self). But this is admitting all that is claimed for self-consciousness.

(2) Others that say the present consciousness contains past consciousness within it in the form of idea; and is conscious of itself as present consciousness, and of the ideas which it contains as reproductions of past conscious states. But how can a state of consciousness be conscious of itself and of other states, and recognize them as past and present? Surely this is an abuse of words.

2. *Materialism*, on the other hand, while it gives the same account of mind and self as sensationism, does not hesitate to assume a *metaphysical substance* behind them. But what it assumes is matter and physical forces in the form of organism and brain. These retain their identity; though it is not really an identity of substance

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Self explained as the series of conscious states.

Mill's paradox.

Taken in earnest by many.

Mind—a function of brain.

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Permanent
only in res-
pect of form.

but only of *form*, as the matter of the body is constantly changing. The effects of past experiences are retained in modifications of the brain cells and fibres, making a reproduction of them possible in the fainter form of ideas. Out of brain processes arise present sensations, and along with them, reproductions of past ones, (*i. e.* ideas of memory), and feelings of pleasure and pain. And the series of sensations, ideas and feelings constitutes mind. There is no other unity and identity than those of the brain and organism. The identity of mind is like that of the candle-flame. The particles of carbon and oxygen, which by their combination make the flame, are continually being dissipated in the air, but we say the flame remains the same. What is really the same is only its form so it is with mind.

This fails to
explain the
unity of
mind.

• But this metaphysical theory leaves us with much the same difficulty as the sensationist theory, viz. how to explain the unity of self-consciousness. The successive states mental themselves do not form a unity. And the brain itself is not a real unity, but a plurality of molecules, fibres and cells, constantly changing. The other difficulties of materialism have been referred to. (p. 64).

Too much importance may be attached to the so-called changes of personality. These changes are only superficial, and due to lapses of memory. The essential constitution of the self remains the same. The whole continuous past is still retained subconsciously and may at any time re-assert itself in consciousness. It is only from the sensationist point of view that they can be said to constitute changes of personality.

On the whole then, reason, if it is to be consistent with itself, cannot avoid recognizing the substantial reality and unity of the self as revealed in self-consciousness; and not only so, but must recognize that the reality of self is *the prototype and ultimate source of the ideas of unity, reality and substantiality*, which we extend by analogy to other things. If we did not obtain these ideas by observation of ourselves, we could not derive them from any other source. It is only by resting on the reality of self that we can reach out to the reality of other things. Without this fundamental hold on reality, all experience

would be a disorderly nightmare, and all knowledge and science would be impossible.

We must be on our guard, however, against applying to the self or ego the concrete representations of substance which we use in the case of matter; and thinking of soul as a concrete unchangeable particle, like a grain of sand, or atom of carbon. It is the tendency to apply such a phenomenal, pictorial, "figurate" conception of substance to mind, that has caused the reluctance of many to think of mind as substance at all, and led to the confused sensationism or materialism, or illogical intermixture of both, which pervades so much recent psychology.

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Substance
not to be
thought after
analogy of
material
molecules.

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MENTAL SCIENCE.

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as experiential science.

VI. SCOPE AND METHOD OF MENTAL SCIENCE.

§ 25. The object of psychology is the accurate investigation of the nature of mind through its phenomena, or manifestations. It is now, however, commonly divided, we have found, into two departments, investigating mind from two different points of view—the *experiential* and the *metaphysical*; the one investigating only the *phenomena*, and the other investigating the *reality* which manifests itself in the phenomena; the one form being sometimes distinguished as *scientific* psychology or psychology proper, and the other as *rational* or *philosophical*. The object and method of the metaphysic of mind (as a part of philosophy) have already been referred to (p. 13). The range and methods of the *empirical* science of mind require further (p. 27) consideration. Consider first its *range* or *scope*, and next its *methods*.

The range of
subjects in-
cluded in it.

I. The *sphere and scope of empirical psychology* and the mental sciences is the investigation of the phenomena or manifestations of mind, or mind in so far as directly revealed in its phenomena and products, by the same methods of observation, analysis, experiment, and induction which are applied to the sciences which investigate natural (external) phenomena.

But the phenomena of mind are themselves, we have found, of two kinds, *viz. internal* and *external*, *subjective* and *objective* or revelations of mind directly *to itself* in self-consciousness, and revelations of mind *to other minds* indirectly through changes in the physical world. Hence—

(a) *Empirical mental science* includes within its scope, first of all, *the mind's manifestations of itself to itself internally* in the phenomena of its own self-consciousness, such as the processes of sensation, perceiving, remembering, imagining, conceiving, reasoning, desiring, willing, and the rest, and their products such as percepts, ideas, beliefs, desires, volitions, as they appear in consciousness,—including the ideas and beliefs which its consciousness leads it to form of itself as subject and person, and of the external world.

This then is the sphere of *subjective or introspective* psychology, on which the other form ultimately rests. Indeed all the sciences are dependent in a sense on this form of psychology, because they all involve the use of such fundamental ideas as substance and quality, cause and effect, mind and matter, space and time, concrete and abstract, belief and disbelief (§ 9); and it is psychology that shows how these ideas are formed in the mind, and what is contained in them (though the question, how far and in what sense they correspond to extra-mental reality, belongs to metaphysic). Hence there is much psychology assumed in all sciences, whether it be correct psychology or not.

(b) *Empirical mental science* includes within its scope also *the manifestations of minds to other minds externally through the medium of the organism and physical world*. Thus every mind embodies itself in an organism, and through its organism produces effects on extra-organic things; while these again, produce effects on other organisms, and thereby on the minds which animate them, *viz.* by occasioning sensations in them. The minds thus affected learn by experience to interpret the sensations thus occasioned in them, as phenomena or effects of other minds, though communicated through a material medium. In other words, minds embody and express their ideas and desires in external things and institutions (their products), and other minds interpret them as expressed in these products.

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Subjective
states and
processes.

Results of
subjective
psychology
assumed in
all science.

Mind's mani-
festations of
itself to other
minds.

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products and
manifest-
ations of
mind.

Mental phenomena of this kind (communicated through the medium of objective phenomena) constitute the sphere of *objective mental science*, which seeks to determine what can be learnt of the minds of individuals and of races through such external manifestations of them.

Thus mind manifests itself to other minds in the structure and processes of its organism, especially in brain, nerves, muscles, and organs of sense; and the structure and working of these form the sphere of *physiological psychology*. And when the organic manifestations of mind are made the subjects of measurement and experiment, with a view to determine the duration and degree of the corresponding mental process, this study is called *psycho-physics*, or experimental psychology.)

It manifests itself also in language and literature in their many forms; in works of mechanical art, and fine art; in social manners and customs, in political institutions, in mythologies and religions; and in the events of history. All these involve external products of mind, or effects produced by mind on the physical world, which, again, manifest themselves to other minds and thereby reveal the character of the minds which produced them. Hence these outward expressions and embodiments of mind are sometimes spoken of as *objective mind*—mind objectified or externalized, as it were. All therefore, supply materials which fall within the scope of psychology, and the other mental sciences based on it, such as ethics, æsthetics, sociology, politics, religion, etc.

Hence two
principal
methods of
mental
science.

§ 26. II. The *methods of empirical psychology and mental science* will correspond to the two kinds of phenomena which come within its scope. There will, therefore be two principal methods of psychological investigation, *viz.* by looking inward upon one's own mind, and by looking outwards upon the external manifestations and products of the minds of others; in other words, by the study of our own minds and mental processes, as we are conscious of them within ourselves (the *subjective method*), and the study of other minds through their external manifestations (the *objective method*). Hence—

A. The method of *subjective self-observation; reflection, or self-consciousness*,—which consists in turning one's attention inwards so as to observe the states and processes of one's own mind, as they are going on at the moment, or as they are afterwards reproduced by power of memory.

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The subjective or introspective method.

Thus, one may feel a pain, and may at the same time observe it, so as to compare it with other pains he has experienced, and determine where it is seated, and what is its cause. He may taste two or three kinds of fruits in succession, and observe and compare the different kinds of taste-sensation which they give, and classify them accordingly. He may have sensations of smell, sound, colour, and feelings of anger, hope, fear, and may observe them so as to distinguish them from, and compare them with other sensations and feelings, and classify them according to their resemblances and differences. He may observe and compare the different kinds of intellectual activity exercised in reading a poem, solving a mathematical problem, and composing an essay, and so on.

Ex.

This has been called the method of *reflection* or *introspection*, because it consists in looking inwards upon the contents of one's own mind; the *subjective* method, because it is observation by the *subject* itself of the states and processes of the subject; and the method of *self-consciousness*, because founded on the *self's* consciousness of what is going on within itself. And it is clear that all mental science must rest ultimately upon this method, because it is only by observing them first in one's self, that any one can ever come to know what mind and mental phenomena are.

Objections have been raised against the subjective method by Comte and others. Mental states, it is said, cannot be observed and studied when present in their original and proper form. That would imply that the

Objections have been made to this method.

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But it is fundamental and essential.

mind can do two things at the same time. Thus, it would be engaged in the activity and state to be observed, and at the same time in the activity of observing it; which is impossible. Hence if mental states can be observed at all, it can only be as reproduced in memory in the form of ideas. But the ideas of past mental states need not be like their originals, *e. g.* the idea of a pain is not painful, nor the idea of redness, red. Besides, all mental activity, Comte thinks, flows outwards upon external things, not backwards upon itself. Therefore reflection is an unreliable method of observation.

There is much confusion of thought, however, in this.

(i) To be clearly conscious of a state or process is the same thing as observing it. And if it has not been observed while present, how could there be any memory of it? (ii) Further, all observation, even that of the external world, is in the first instance self-observation, *viz.* an observing of our sensations while they are present, because even external things can be known only through the medium of mental states (§ 9). (iii) Finally, though physical forces proceed outwards upon other things the activity of consciousness is the opposite of this, *viz.* a *reflection* or turning inwards upon self; and it is this power of reflection upon itself or self-consciousness that makes mind to be different from nature, and to be the self-contained, individual reality which it is—in other words, to be “being for self,” (as non-mental things exist for others, so to speak, and not for themselves).

The objective method.

B. The method of *objective observation*,—which consists in looking outwards, and observing the external manifestations of the minds of other beings, and inferring their mental states and processes from their outward manifestations and products.

For we cannot observe the minds of others in the same way as we observe our own. Our own mental states are *directly* present to us in our self-consciousness; but the states of other minds, and the very fact that other beings have minds at all, can be known to us only *indirectly*, *i. e.* by inference. We find that our own feelings, thoughts, reasoning powers, and volitions embody and express themselves in certain outward looks and gestures,

sounds, movements, actions, and works. And wherever we observe the same outward expressions, actions, and products in others, we know by inference both the fact that they have minds like ourselves, and the states, processes, and general character of their minds. Hence by this indirect method we can observe and understand not only the minds of our fellow men, but to some extent those of animals also.

But there will be as many methods and departments of objective mental science as there are classes of external manifestations and products, through which the minds of other beings may be understood. Hence it will include—

The objective
mental
sciences.

(1) The observation by every man for himself of the looks, words, actions, and achievements of his fellow men individually; from which he is able to judge the working of their minds, their intellectual powers, dispositions, and characters. Thus, by continuous observation of this kind, the gradual development of mind and character can be traced in children, and the conditions discovered, to some extent, on which they depend. The psychologist, therefore, depends largely on observation of this kind.

The reading
of other
minds.

Animal psychology, which attempts to understand and trace the development of mind in the lower animals, must depend on such observation of their outward habits and works, combined with the study of their brains and nervous systems; and some think that knowledge of the animal mind thus acquired may cast some light upon the origin and development of the human mind.

(2) The systematic study of the *history of nations* their achievements, manners and customs, institutions and laws; because these things are external manifestations of the *collective* mind of a nation, and in these the psychologist can read the character and development of the national mind, from the primitive childishness of the barbarous state up to civilization and refinement.

Sociology.

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religion.

(3) The study of the *permanent external products* of the minds of individuals and nations, which are lasting embodiments of their thought, feelings, and character.

This will include the study of *works of art*, e. g. the remaining buildings and sculptures of ancient Egypt, Greece, and India ; of the *languages* of nations, for their minds are reflected to some extent even in their forms of speech ; and above all, the study of their *literatures*, *mythologies*, *religions*, because these express the intellectual and 'moral character of a people more clearly perhaps than any thing else. Hence the sciences of history and sociology, of comparative mythology, and of religion may be regarded as branches of mental science, and works have been on "comparative" and "national" psychology.

At the same time it is to be observed that these studies have their bases in subjective psychology and metaphysic. Thus the science of art (æsthetics) depends ultimately on subjective analysis of the mental processes in which the feeling and appreciation of the beautiful consist (*the sentiments*), and metaphysical consideration of the ultimate reasons why such and such things should seem beautiful. The study of religion supposes not only the study of actual religions (above referred to), but also analysis of the feelings and ideas involved in religion (psychology of religion), and the question of the truth of these ideas, i. e. their correspondence to objective reality (metaphysic of religion).

Physiology.

(4) The study of the different *organic states and processes* which (according to the principle of concomitance) accompany the different stages and processes of mind. And the organic processes which are most directly concomitant with those of mind are the processes of the brain, nerves, and organs of sense. Hence the study of these organs and their processes will be an essential part of objective psychology, and is now much cultivated under the name of *physiological psychology*; though it must be admitted that it is rather the structure of the

organs (nerves, cells and ganglia) than the processes performed by them, that it has succeeded in elucidating; for the physical processes which most closely correspond to mental ones still remain obscure.

And closely connected with this is the class of experiments known by the name of *psycho-physics*, which attempt to apply measurement to the processes of mind by first applying it to their physical concomitants. Thus stimuli of different degrees of intensity may be applied in order to determine what degree of sensation follows upon a particular degree of physical stimulation. Objects may be presented to vision under many different circumstances in order to ascertain how it is that we perceive the distance, size and shape of things by means of vision. A limb may be stimulated in order to ascertain the time needed to transfer the stimulus to the brain and produce the sensation, and to move the limb (the time needed for sensation and reflex reaction). A command may be given to do something, in order to ascertain the time between the stimulus and the action (the time needed for sensation, understanding, volition, and voluntary reaction). Instruments of extreme delicacy have been invented for experiments of this kind; laboratories have been constructed, and elaborate tables of results have been drawn up; and many think that by this means a "new psychology" will be created.

§ 27 But neither the subjective nor the objective method is sufficient by itself; mental science requires the combination of both.

This follows from the very nature of scientific knowledge itself; for propositions (knowledge), in order to be *scientific*, must be—(i) *Certain*,—thus the proposition that "thunder occasioned by an electrical discharge" is certain and scientific, but the proposition that "light is an electrical phenomenon" is not scientific, because uncertain—(ii) *Accurate*,—thus the proposition that "it rains every day in July," is not scientific, because it is not accurately, but at most only approximately, true. But if we were to take the number of rainy days in that month every year for a century, and to take the average of these, then the propositions that "it rains so many days on the average," would be scientific; and—(iii) *General*,—that is, they must not be merely singular propositions, true only of

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Psycho-physics—experiment in psychology.

Ex.

Both methods are necessary to make mental study scientific.

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particular individual things or occurrences, but must be true of whole species or classes; thus "*A* is a good-natured person" is not a *scientific* truth, because it applies only to an individual; but "*A's* mind is made up of the three correlative processes of feeling thinking, and willing" is scientific, because it is the application of what is generally true of the whole class of things called minds. (§ 3).

It follows from these conditions of scientific knowledge that both methods are necessary to make a *science* of psychology. For in the first place—

(1) The *subjective* or *introspective* method is necessary, because we should never know what mind and mental states and processes are except by being conscious of them, and observing them in ourselves; and we can read and interpret the external manifestations and products of other people's mental states and processes (*objective* observation) only after we have been conscious of such states and processes in ourselves by *subjective* observation.

Thus, a man who is blind or deaf can form no idea of what colour or sound is; because he has had no experience of them in his own consciousness; and a being who had never himself experienced pain would be unable to interpret the manifestations of pain in other beings; and the more varied and intense our own mental states and experiences have been, the more *correctly* can we interpret those of others.

(2) But the *objective* method also is indispensable—because our own mind is only *one*, and we should never, by observing it alone, come to know accurately what is true of mind *generally*. But knowledge of mind, to be scientific, must not only be certain and accurate, but must be true of mind generally—it must be general knowledge—and knowledge of other minds can be arrived at only by supplementing the subjective method with the objective one,

And each of these psychological methods has its own peculiar difficulties.—

The subjective method has this difficulty especially, that to employ it rightly requires exceptional power of intellectual "abstraction." In order to observe a mental process with the certainty and accuracy which scientific method requires, it is necessary to isolate it in thought from other mental processes, and concentrate the attention upon it by itself. But this is difficult to do, because mind at every moment is a complex of states and processes, going on simultaneously or in quick succession, and each depending more or less upon all the rest. This makes it difficult to fix the attention upon any one to the exclusion of the rest, so as to obtain a clear and accurate conception of that one by itself.

Thus, concrete sights, sounds, and emotions are always tending to draw away the attention from abstract ideas, and absorb it in themselves.

(2) The objective method, again, has this difficulty especially, that we have a tendency to fancy always that other people must feel and think about things in the same way as we ourselves do ; and hence to judge the minds of other people too much according to the standard of our own.

Hence it is, that children have difficulty in understanding the ideas, feelings, and conduct of grown-up people, because they have not yet experienced them ; while the latter find it hard to understand those of children, because they have long forgotten them ; and one nation is apt to misunderstand another nation, especially when far removed from itself in place or time.

Hence to understand the minds of other people, it is necessary :—

(a) To consider carefully their external manifestations—where they agree with, and how they differ from, those of our own minds—

(b) To be possessed of considerable power of imagination, i.e., power of putting together elements from our own past experience in new combinations, so as to form conceptions of circumstances and mental states more or less different from any that we ourselves have experienced—because the circumstances and states of other minds always differ more or less from our own.

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Difficulty of
the subjective
method.

Of the objective
method.

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All mental
science rests
on subjective
psychology.

The three
factors of
mind.

Striving.

Feeling.

Knowing.

Giving three
classes of
mental pro-
cesses and
products, viz.

VII. FUNCTIONS OF MIND.

§ 28. We have found that psychology divides mental phenomena into internal and external, subjective and objective; but we have found also that the so-called objective mental phenomena are mental only in the sense that they manifest to us the subjective phenomena of other minds. Hence all mental science supposes and rests ultimately upon the psychology of *subjective* mind.

Now the subjective mental life consists in "the stream of consciousness," in which the mental principle manifests itself to itself, and which every individual is aware of within himself. Consciousness, however, is never simple, but made up, as we have found already, of three correlative factors—conscious *activity* or *effort* of reaction; and self-preservation, producing changes of state and of relation to the external world; *sensibility* or *feeling*, agreeable or disagreeable, rising out of the changes thus imposed upon the self; and in or through the sensibility, *cognition* or *knowledge* of the realities manifested in them, and therefore of the *self* as the *subject* of these changing states, and of the *not-self* as *implied* in them, (*viz.* as their occasion or cause).

Hence these three elements of *conation* or *striving*, *feeling*, and *knowing* or *thinking*, are evidently contained as correlative factors in every phase of consciousness; and in such a way that all three depend on each other reciprocally, and that consciousness itself results from the co-operation, so to speak, of all three. Now it is on this apparent *triplicity* of consciousness that the common *tripartite* classification of mental phenomena is based.

For we find that, though all three factors are always present simultaneously, yet they differ in relative degree, and one factor usually predominates over the others, and determines the form of consciousness for the time being. Thus—

(i) At one moment, we may be so engrossed with *feeling, passion, or emotion* (especially when it takes the extreme forms of pleasure and pain) that both *thought* and *action* are depressed for a time.

(ii) At another moment, we may become too much absorbed in *thinking* (i. e. in trying to interpret and understand our feelings and sensations) either to *feel* deeply or to *act* promptly.

(iii) And at another, we may throw ourselves so exclusively into effort or *action* in order to escape from a disagreeable, and maintain or recover an agreeable, state of feeling, that both feeling and thought are reduced to a minimum for the time being.

Hence the now common division of mental processes into three classes or departments seems sufficiently well grounded in the nature of mind and its relations to the world; but it must not be understood as implying that consciousness is wholly employed for a time with one class, and then abandons it, and enters upon another. Rather they all go on simultaneously; but some one always predominates in intensity over the others, and gives its own colouring to the whole for the moment. Hence mind may be engaged at one moment in *thought* mainly, at another in *feeling* or *emotion* mainly, and at another in *volition*; while each of these fundamental functions themselves assumes different forms. Hence we distinguish the three main classes of mental processes according to the fundamental function predominant in each. Thus—

§ 29. I. *Sensibility, Affection, or Feeling* (in the wider sense of the word) is that kind of consciousness which arises from the different ways in which the self is acted on and affected by the surrounding world and by its own activities, i. e. its efforts of interaction with the world; and is distinguished as agreeable or disagreeable, and in extreme

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Feeling,
thought and
volition.

Hence the
tripartite
classification.

Affection, or
consciousness
of being acted
on.

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How
produced.

cases, as *pleasurable* or *painful*, according as the changes of state thus imposed on the self are for the better or worse.

Thus the self is placed in the midst of a world, and is limited, acted on, affected by the world at every moment *from without*, through the medium of its own organism; and is, every moment, reacting for its own self-preservation; and its efforts of reaction are continually affecting itself and its organism *from within*; and the consciousness of being *affected* in these various ways is commonly called *feeling*.

Feeling in this sense, then would seem to be the primitive and fundamental form of consciousness—its crude material, so to speak—and that in which the other two factors, *vis.* intellect and volition, are at first latent, implicit, potential, so that they have to be differentiated, and developed gradually. For though we can hardly ascribe *explicit* thought and will to the lower animals, we cannot deny them the possession of pleasurable and painful sensibility in some degree.

For this reason, then, that feeling is the very essence of consciousness, it is possible to define, or even describe it to any purpose. Its nature is merely to be *felt*, and every one feels it for himself, but cannot define it to another. Some, indeed, have gone so far as to identify it wholly with pleasure and pain, as if these were the essence of feeling, and its different forms were but different degrees and modifications of pleasure and pain. But pleasure and pain are themselves extreme and opposite states; and suppose intermediate forms of consciousness which are not distinctly either pleasurable or painful. Rather pleasure and pain are either qualities of feeling, or extreme forms into which feeling tends to rise and fall.

Two branches
of affection.

Now feeling (if we use that word to include all the consciousness which rises directly from the self's being *acted on*, *modified* or *affected*) will include two main stages or phases, each of which will include many forms under it, for nothing is more shifting, vague and indefinite than feeling. Thus—

Primary or
sense feelings
—how pro-
duced.

1. The primary feelings or *sensations*, are elementary forms of consciousness rising out of those changing states of the self which are occasioned directly by

changing states of extra-mental things (directly by those of the organism, which again may be caused by changes of extra-organic things). Thus sensations of resistance, hardness, weight, heat and cold, colour, sound and the like are occasioned by corresponding states and qualities of things, affecting the self through the medium of the organism. And these impressions from without are felt as pleasurable or painful according as the states of the self to which they give rise are beneficial or otherwise.

Hence, not only will there be many different sensations, according as the self is affected by the different states and qualities of things, but all or most sensations will include two elements *viz.* what may be called —

(a) The *presentative* element of the sensation, *viz.* that more definite and distinct element in the sensation which most directly corresponds to the forms and qualities of the external things occasioning it, and which may therefore be said to *present* (or *represent*) that form or quality to the mind, in terms of its own consciousness. It is these impressions or *presentative* elements of sensation, therefore, that supply the "materials" out of, or by means of which, the self, by its intellectual power, constructs its *knowledge of external things*. We know the existence and qualities of external things through the sensations which they give us, but mainly through the more purely presentative elements of sensation. And also what may be called —

(b) The *tone* or *æsthetic* element of the sensation, *viz.* the feeling of agreeableness or disagreeableness, pleasure or pain which accompanies the impression, and arises from the way in which the whole system collectively is affected by it—whether beneficially or injuriously. (This has been called also the *affective* element, but really the whole sensation is *affection* in the literal sense of that word).

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Constituents
of sensation.

Presentative
element—
the mental
impression.

Æsthetic
element—the
tone of sensa-
tion.

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Thus the *presentative* element may be said to arise from a definitely local, and therefore distinct affection of the system ; its agreeable or disagreeable *tone*, from its *general* and therefore *vague* effect on the whole system.

In some forms of sensibility this æsthetic element predominates, as when we suffer from a cut or burn, hunger, cold, or headache, which gives much pain, but little knowledge of anything. In others, the presentative or knowledge-giving element predominates, as in touch and vision. (Indeed it may be doubted whether the latter sensations are not usually *neutral*, i.e. free altogether from any appreciable tone of pleasure or pain).

It may be observed that the importance of the *presentative* elements of sensation to knowledge has led some to separate them from the affective elements, and ascribe them to the factor of *intellect*. But this, besides confusing the threefold division of mind, and introducing heterogeneous elements into intellect, is open to the objection that the *presentative* element is of precisely the same origin as the *æsthetic*, being itself in fact an *affection* of the self—a consciousness of being *affected* or *acted on* from without. Finally—

Secondary
feelings or
emotions—
how pro-
duced.

2. The secondary feelings or *emotions* belong to a higher phase of mental development than sensations, being *the feelings caused in the mind by the ideas and beliefs, arising out of its own intellectual activities*. The sensations are forced upon the mind from *without*, in consequence of its changing relations with the external world; and therefore precede, and supply materials which the intellectual processes of perception, memory, imagination, and reasoning elaborate into knowledge of things. The emotions on the contrary are feelings arising from the ways in which the mind and organism are affected from *within* by these intellectual operations and the knowledge which they give. Both classes are *affections*. But in sensation the self is *affected by the external things with which it comes into relation*. In emotion, it is affected by *the products of its own thought*.

Hence the emotions are such feelings as fear, anger, hope, jealousy, sympathy, reverence, ambition, pride, and so on ; which suppose some power of understanding

remembering, reflecting, and drawing inferences, and rise out of ideas and beliefs, whether true or false ; and are agreeable or disagreeable according as the things thought or believed in are favourable or otherwise to the ends and aspirations of the self.

§ 30. II. *Thinking, Intellection, or Cognition* is the self's power of *distinguishing the different elements of sensation and feeling, apprehending the realities underlying and manifested in them, and using them as means and materials for arriving at knowledge of the world and of itself.* It therefore includes the self's powers of *discriminating or differentiating* different kinds and degrees of sensation and feeling ; of *interpreting or understanding* its sensations as manifestations of, and as therefore representing forms and qualities of substantial things, of *retaining and reproducing* them in the form of mental images, and integrating them into ideas of things and classes of things ; and of *reasoning* from present things ; to things past, distant and future, thus arriving at a knowledge and understanding of the world as a whole. These are its principal phases or applications, but the essence of it evidently consists in distinguishing the different elements of sensation, and apprehending the realities underlying them.

Intellection,
or activity of
knowing and
thinking.

Thus in rational beings, every state of sensibility is accompanied by some activity of intellect or understanding. A pain is discriminated from other conscious states, and interpreted as meaning injury of some part of the body ; a sound is distinguished from other sounds and understood as implying a sounding object ; sweetness, as implying the presence of a soluble substance in the mouth ; colour, as implying an object reflecting light ; resistance, an object occupying space, and so on. And the impressions thus distinguished from each other, and understood as phenomena or manifestations of things, are retained and combined together into ideas of real things and classes of things, and these again into a collective conception of the world.

It is evident, therefore, that intellection is an extremely complex process. Indeed, it is so complex that no

Complexity
of intellect.

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psychologist or logician has succeeded in explaining all that is involved in it. In attempting to analyse it we have first to consider the *essential factors or functions* which make it to be intellect, and therefore reappear in different forms in all the different stages and applications of intellect; and then these different *stages* and *applications* themselves, called the intellectual faculties, though these will require more detailed consideration afterwards. Hence—

Its essential
constituents.

A. As to the *essential intellectual functions* which enter into all the operations of intellect—these may be reckoned as three—*viz. discrimination* (with its correlative *assimilation*), *apprehension* or *understanding*, and (though perhaps less primitive and fundamental) *conservation*. Thus—

Discerning of
differences
and agree-
ments.

(a) *Discrimination* and *assimilation* are the activities of distinguishing of differences and agreements among the elements of sensation and the higher processes and products of thought. They are essentially however parts of one and the same process, because differences and likenesses always go together—“No two things in the world,” Leibnitz says, “are entirely alike, and none are entirely different”—and enter not only into the most elementary consciousness (Law of Relativity, § 21. IV. 1.), but into the highest operations of thought. Thus :—

Discerning of
differences.

Discrimination or *differentiation* (in some forms called *analysis*) consist in the discerning and distinguishing of differences, first between units and qualities of sensation, and afterwards between the ideas which are constructed out of these materials. A consciousness of one continuous state without plurality, change, or difference, would be impossible. A creature living in unchanging darkness would have no consciousness of darkness. Consciousness therefore, supposes plurality and differences of units and qualities as its condition; and the primordial element (perhaps) of intellection will be the activity of discriminating these differences, and thereby distinguishing these things and qualities of things.

It is, in fact, this intellectual activity of discriminating the different states of organism and self that raises these states into conscious feelings, and thereby into materials of knowledge. It is not meant, of course, that intellect can discriminate states before they have manifested themselves in feelings, but that the feeling and the discrimination of the feeling exist together as factors of the same process, each making the other possible. The term—

Assimilation may be used for the discerning of *similarities, likenesses, agreements*, between the different units and qualities of sensation. . Wherever there are differences between things, there are also similarities or communities of kind, and we can hardly discern differences (or at least realize clearly the meaning of difference) without at the same time discerning similarities, and contrasting them with differences; so that the discerning of differences and agreements seem to be but two factors of one and the same process.*

Discerning of similarities.

Thus, even between light and darkness there is this community of kind, that they affect us through one organ, and one kind of sensation, *viz.* vision. Mercy and cruelty, though opposite in one sense, yet agree in another, *viz.* in being both qualities of will and character. Hardness and roughness agree in being affections of tactual sensibility. Similarity therefore, will be found to be the special ground of classification, generalization, abstraction, and reasoning (though always in conjunction with discrimination of differences).

(b) *Apprehension, Understanding, Cognition*, is primarily the self's power of discerning the realities underlying and expressed in its feelings and activities, and conceiving these as manifestations of realities. Thus neither self nor not-self could be known unless it manifested itself in activity and sensibility of some kind; and feeling would be nothing if, in being conscious of the feeling or phenomenon, we were not aware at the same time of something manifested in it (*viz.* self and not-self. § 21).

Apprehension.

This then is essentially what is meant by *cognition* or *knowing*—the typical function of intellect. It begins with the apprehension of reality as directly presented in and through sensation. And this apprehension of reality, thus presented more or less distinctly in all cons-

Its fundamental applications.

En

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ciousness, appears, we have found, in two forms :—

* *Self-consciousness*, or internal perception, in which the self apprehends itself as subject and agent of conscious state and acts ; and

* *Other-consciousness*, or external perception, in which it apprehends another reality—not-self—as the external occasion and ground of its sensations and activities, The latter has to be considered further under the head of perception.

Conservation
or integra-
tion.

(c) *Conservation* is the self's power of retaining and incorporating, as it were, its impressions and cognitions into its own system, making them a part (sub-consciously) of its own constitution, and raising them (in some cases) into clear consciousness again, in the form of ideas of *memory* and *imagination*. Only some cognitions indeed are revived as distinct ideas (remembered) ; but there is reason to believe that all are retained as at least sub-conscious constituents of mind, and go to determine its general character, and modify collectively its future thought, feeling and volition.

This conservation and partial revival of cognitions, so essential to mind, is to be explained as a tendency to *growth, development* or *integration*, and this takes place partly by—

By assimila-
tion.

Assimilation (in the sense of the *amalgamating* of similars), because in discerning the similarities of things, mind has a tendency to amalgamate many similar impressions into one collective and general idea, and to preserve and revive them in this abbreviated, collective form. In this way, assimilation becomes an integrative and conservative force, and leads to the formation of general (class and abstract) ideas, and thereby makes reasoning possible. And partly by—

And by asso-
ciation.

* *Association*, which is the tendency to connect together *different sensations, things, and events in thought*, in the same order and connection in which they have been found to go together *in experience* ; so as to think and remember the sensations as qualities of the same thing, things as parts of the same whole, and the events as parts of the same series.

Thus, the touch, colour, shape, taste, and smell of a particular fruit being always experienced together, the

intellect by its integrating power connects them together as qualities of one thing ; and the events of a day, having been experienced in a continuous series, are connected together by thought, and remembered as a train of events.

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Thus assimilation and association may be spoken of as the integrative and conservative functions of intellect. And of these, the *associating* activity is the function specially concerned in the construction of concrete ideas from the materials of sensation, and in the reproduction of concrete ideas in memory—things being remembered through the *associations* or *connections* which have been formed in the mind between the ideas of them. And *assimilation* is concerned chiefly in elaborating and transforming past cognitions into, and reviving them under the form of general ideas ; by means of which cognitions are classified and organized, and reasoning made possible from the past and present to the future.

The conservative functions.

The conservation of impressions and ideas in the mind has some analogy, it may be observed, to the conservation of forces in nature. We know that a physical force which has once operated is never lost, but, though latent in potential form for a time, may reappear actively at another time. So a cognition once amalgamated with the mental system is, we may safely say, never lost, but, even when not revived as a distinct idea, helps subconsciously to determine the character of the mind as a whole.

Thus, (1) through its function of *discrimination* the ego analyses its states and experiences into their constituent elements and parts, and raises them into clear consciousness. (2) Through its function of *apprehension* it understands them as expressing and manifesting substantial realities, and thereby comes to understand self and not-self as a world of concrete realities (substances and attributes). (3) And through its function of *conservation* it makes the cognitions thus acquired to be its own permanent property, incorporating them into its own mental constitution, and making them the means of anticipating the future by means of reasoning.

Recapitulation.

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account.The intellec-
tual facul-
ties.

Acquisition.

Representa-
tion.

But to purely sensationist psychology, it may be observed, the functions of intellect are simply *discrimination, assimilation and association*.^{*} It assumes that no special function of apprehension or understanding is needed. Knowledge is formed by the accumulation of sensations, the automatic association of these into clusters (called things), and the automatic fusion of these into general and abstract ideas by assimilation.

B. As to the *applications, stages, or phases of intellectual work* (sometimes called the *faculties of intellect*), by which the mind rises from the elementary discrimination of different kinds and degrees of sensibility up to knowledge of the world, these will include—

(a) *Faculties of Acquisition*, by which the elementary materials or data of knowledge are acquired, out of which higher knowledge may be elaborated by higher forms of intellectual work. Now acquisition supposes—

Primary feeling or sensation, through which, reality manifests itself to mind, and which therefore supplies elementary materials for intellectual work, and—

Perception or elementary cognition, in which mind apprehends the realities manifested in its sensations, or understands its sensations as manifestations of reality. This again includes, as found already—

Internal perception in which mind apprehends itself as subject of sensations, and—

External perception in which it apprehends a not-self or external world as the occasion or cause of them.

(b) *Faculties of Conservation and Reproduction*, or the processes of retaining the results of perception and in some cases reproducing them in the form of mental images, representations or ideas. Reproduction in the form of ideas takes the two forms of—

(a) *Memory*, which supposes percepts or experiences of things, and consists in retaining them in the mind, and afterwards reviving them in the form of mental images or ideas when the things themselves are no longer present.

(b) *Construction or imagination*, which supposes images or ideas of memory, and consists in reconstructing

them into new forms and combinations, different from any actually perceived by ourselves.

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Elaboration.

(c) *Faculties of elaboration, or logical thought*, which suppose the concrete ideas of things which we have actually experienced in perception, and preserved and reproduced in memory, and modified in imagination; and consist in reducing them to general ideas, and using them as means of extending our knowledge beyond the range of actual perception and memory, to things past, distant and future which we have never perceived at all; thus rising above the limited sphere of personal experience to knowledge of the world as a whole.

This abstract thought, again, is the sphere of logic and includes under it the logical processes of *judgment, conception and reasoning*.

§ 31. III. *Conation or volition* (in the widest sense of that word) is *the continual effort and energy by which the mental principle strives to preserve its own existence* in interaction with other forms of being; to adapt itself to continually changing circumstances, and its circumstances to itself; and to develop and perfect itself as a personal self-conscious being.

Volition.

Conation manifests itself in consciousness, not merely by the changes of state which it produces, but also in the peculiar consciousness of *effort, activity, causality*, which it gives. For the difference between the consciousness of *acting and that of being acted on* is the most radical in all our experience; because, while the latter reveals the self as subject of passive sensibility or feeling merely, the former reveals it as a *focus of self-preserving, self-developing activity*, i. e. as a *voluntary agent*.

Its characteristic.

Thus, by continual effort the self controls its organism, moves its limbs, and adapts itself to the external world by changing its position, and the world to itself by

Its work and use.

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producing changes in things; thereby avoiding such relations as are injurious and painful to itself, and attaining and prolonging such as are beneficial and pleasurable (*physical effort*). And by effort of concentration it exercises and regulates its intellectual power, so as to obtain knowledge of the world, and thereby be better able to adapt itself to *it*, and *it* to itself (*intellectual effort*, or *attention*). (And we may even go so far as to suppose that it is by subconscious effort that it raises its own changing 'subconscious states' into the light of consciousness (*viz.* in sensibility), in order to distinguish between what is beneficial and what is injurious, and attains the one and avoids the other).

Not the
essence of
mind.

This has led some to make will (taken in this wide sense of *effort* or *striving*) to be the very essence of mind, and the other factors, sensibility and thought, to be only auxiliary. But it is obvious that without conscious sensibility and discrimination of sensibility, with memory of the past and anticipation of the future, *will* would be only unconscious automatic *energy* or *force*, and not really *mind*, which supposes the co-operation of all the three factors.

Its different
modes.

Now the work of conation or volition may be subdivided according to two principles of division—according to the *ways in which it operates*, and according to the *directions* in which it is turned, or *purposes* for which it is applied. Thus—

Automatic
conation.

I. *As to its mode of operation*—it may operate (a) *without any clear consciousness of the object, end, or purpose* for which it is operating (or even sub-consciously), and therefore without any distinct *desire* or *intention*.

That is, it may be conation or effort, but *spontaneous, automatic, unintentional effort*. And in this primitive form it includes, (besides sub-conscious efforts,) the conscious forms distinguished as *spontaneous* or *random*, *reflex*, and *instinctive* activities, and in a sense also *secondary automatic* or habitual actions.

(b) Or *consciously and purposively*, i. e. with full consciousness not only of the activity, but of *the object, end, or purpose to which it is directed, and explicit desire and intention to attain that end.*

This is will in the narrower and stricter sense of the word; and is the sense in which the word is used in ethics, and when we speak of free will.

2. And as to the direction in which it is turned or purpose to which it is applied,—it is clear from the above that effort of will may take two directions, so to speak, and perform two apparently different functions. Thus—

(a) It may take the form of attention or effort of thought, i. e. it may turn inwards, or remain within the compass of the mental and organic system itself, and take the form of intellectual activity for the purposes of thinking and reasoning. In this case it will consist in intensifying the intellectual activity and concentrating it upon some sensation, percept or idea within the mind in order to discriminate and assimilate it more clearly, and integrate it more closely with other ideas, and thereby remember it better, and apply it for purposes of reasoning.

This application of will to thought within the limits of the mind itself is called *attention*, and keeps up the continual elaboration of sense-materials into knowledge.

(b) It may take the form of movement, i. e. it may turn *outwards* so as to give rise to an evolution of force in the brain, and a discharge of it along outgoing nerves to contract the muscles, move the limbs, and produce changes in external things; whether for the realization of desires, intentions, purposes of the mind (*purposive action*), or from blind instinctive impulse (*automatic action*).

The application of *active effort* to external movement is always accompanied and distinguished in consciousness however by *passive feelings*, arising from the tension and fatigue of the muscles and limbs; and is commonly thought of as volition, action, conduct, by

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Purposive
conation.

Its different
applications.

Intellectual
effort—
attention.

Motor effort.

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pre-eminence ; but, from a psychological point of view, it does not differ essentially from its inward application to thought.

But the above two functions of conation are less opposed to each other than they seem ; for it is found that, as for every processes of mind there is a corresponding physical process, so, for every *inward effort of attention*, there is an *outward physical effort*, and *vice versa*. Thus—

Organic processes involved in both.

(1) Even in the *internal effort* of concentrating, and fixing the intellectual activity upon an object of observation or thought, there is a corresponding muscular effort to turn and steady the body, and direct the organs of sense upon the object ; and even when the object of attention is but an idea within the mind, e.g. a diagram, or a piece of music, represented in idea, we are clearly conscious of an effort of the same physical organ which originally gave the idea, and of fatigue of the organ when the effort is prolonged.

(2) And the *external* direction of effort, to move the limbs and produce changes in external things, is always preceded and accompanied by an *internal* direction of it, viz. in the form of intellectual concentration upon the object or end of action present in idea, and upon the means and movements necessary to attain the end, which are also present in idea (except in the case of blind instinctive action).

From this it would appear that intellectual attention and physical movement are but two phases of the same action, beginning inwardly in thought, and manifesting itself outwardly in movement.

Relation of the essential functions and processes.

§ 32. We are now able to *define more precisely the relations to each other*, of the three fundamental functions of mind and classes of mental processes. And we find that they stand to each other in two apparently contradictory kinds of relation.

Their antagonism.

1. Experience shows that, in one sense, they stand to each other in a relation of *antagonism*. For though they may always be present as factors of mind, they are not present in the same *degree*. Consciousness oscillates between them, and the more full, intense, and absorbing any one of them becomes, the fainter do the others be-

come. It seems as if mind were a constant quantity, so that the more it is absorbed by any one function, the less is left for the others.

Thus, when any strong emotion rises in the mind, such as sorrow, fear, remorse, then both intellectual activity and physical action sink to a minimum; the more the mind occupies itself with intellectual discrimination, the lower does the degree of feeling and physical activity sink; and by throwing itself into effort of any kind, it lowers the degree of thought and feeling.

2. But from the fact that they are all equally fundamental, it follows that their relation is, in another sense, one of *concomitance* and *reciprocal dependence*, such that none of them can go on by itself, but each depends on the others; and that all go on simultaneously, or in such rapid oscillation as to be practically simultaneous—each both depending on, and supporting the others reciprocally. Thus—

(a) *Intellection* supposes and depends on both sensibility and conation.—(1) On *sensibility*, because there can be no intellectual discrimination without materials to discriminate and integrate; and the materials must be supplied by states of the organism and self, which express themselves in consciousness as affections or feelings, especially those called *sensations*, while intellection, again, cannot go on without itself producing effects on the organic and mental systems, which express themselves in the feelings called *emotion*. And

(2) On *conation*, because effort is necessary both to keep up the intellectual activity, and to concentrate it upon definite objects of thought.

(b) *Sensibility* or *feeling*, again, depends on both *intellection* and *conation*.—(1) On *intellection*, because there can not be consciousness of states without intellectual discrimination, of their different units, degrees, and qualities; while the kinds of feeling called emotions have this further dependence on intellect, that they rise out of previous processes of ideation. And

(2) On *conation*, because effort is necessary at every moment to keep up that activity of intellectual discrimination, which is necessary to keep up the consciousness of feeling, (*i. e.* to raise the states of the or-

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Their
reciprocity.

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ganism and self into clear consciousness as sensation and emotion); while the continual effort to keep up, or escape from feelings, serves to raise them into clearer consciousness.

(c) *Conation*, again, depends on both feeling and thought,—(1) On *feeling*, because mental effort must always be effort either to keep up a conscious state, as being agreeable or pleasurable, or to escape from a state which is disagreeable, and realize one which is expected to be more agreeable. And

(2) On *intellection*, because it always supposes the ideas of other states besides the present state, and discrimination and comparison between these states as better and worse. And in the case of fully developed volition, it supposes a complicated process of ideation, *viz.* in deliberating about and choosing ends of action, and the means of realizing them.

Thus, none of the three functions is complete in itself, but each both supports, and is supported by the others reciprocally.

The above is an analysis of the processes which go on simultaneously or in close succession in mature mind. It must not be supposed, however, that they are thus distinct and explicit from the beginning. In the lowest forms of mind they are present only *implicitly* or *potentially*. They have to be *unfolded* or *developed*. This unfolding of the capacities latent in mind includes what under certain circumstances is called *education*. It is of the utmost importance, therefore, to understand the laws and conditions of mental development; and much of the practical importance of psychology consists in the light which it throws on these. Hence—

VIII. THE DEVELOPMENT OF MENTAL LIFE.

§ 33. What then is meant by *development*? A thing is said to develop (i) when an increase takes place not only in its *mass*, but (ii) also and more especially in the number of its *parts*, and of the *functions* (or different kinds of work) performed by them, and (iii) in the perfection with which they *co-operate together* for the unity, preservation, and

But they are
results of
development.

Meaning of
development.

greater perfection of the whole ; and (iv) when this growth in mass, and *differentiation* and *integration* of parts and functions is accomplished by *an energy seated within and working from within the thing itself*, drawing materials into it from without, and assigning them their proper places, and making them all work together as one *unitary whole for one common end*.

Increase by development, therefore, is opposed to increase by *chance combination* of materials, like that of the rolling snow ball, and to *mechanical construction*, like that of a building. In these, the materials are dragged or driven together by forces operating from without ; so that the thing is put together by forces foreign to itself, and has no constructing and unifying energy within itself.

In *what classes of things then is development found* ? We sometimes hear of the development of crystals in a liquid, because the crystal, once begun, has the power of drawing to itself molecules of the same kind, and making them arrange themselves in symmetrical layers, one outside another ; but there is no real quality of parts, nor division of functions, among the mass of molecules which make up a crystal, so that its growth is not really development.

With more reason we may speak of the development of planetary systems from primitive nebulae, *e. g.* of our own solar system, because the sun, planets and satellites have differentiated gradually, it is believed, from a single homogeneous substance, and by their attraction (due probably to their original unity) hold each other together in a moving equilibrium, so as to form a *unity in plurality* ; but, still, there is no real division of labour, nor reciprocity of functions, among the members of the system.

Development therefore, in the highest sense of the word, *begins with life*, and *rises from the sphere of life into that of mind*. And the meaning of development

PART. III.
CHAP. VIII.

Growth,
Differentiation and Integration.

En.

In chemistry.

Cosmology.

Biology.

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CHAP. VIII.

Contrast of
mechanical
structure and
organization

may be best illustrated by comparing the increase of a living organism, such as a *tree*, with that of a mechanical structure, such as a *building*.

Thus, in the case of the building, there is some one who forms the idea or plan in his mind ; and there are the energies of the many labourers who select and bring together the materials, shape them, and raise them into their places, according to the design of the master. Thus everything is done by forces from without. The house has no plan and no energy within itself ; it is only a passive product of forces external to itself, and not a product of development.

But the tree begins as a microscopic germ from another tree ; and in that germ there is already contained both *the plan of the whole, and the energy which carries out the plan by operation from within*. It begins by appropriating the heat of the sun, and transforming it into force, by which it draws external materials of air, earth and water into itself, selects what is suitable to its own growth, and rejects the rest ; and projects the selected materials into their proper places according to a plan inherent in itself ; and thus evolves from within all the organs which are necessary to its own continued life and growth, and gives unity and order to them all, and makes them all work together as one identical thing. Thus the relations of the organs and the common life of the whole is reciprocal. The life evolves the organs, and the organs by their co-operation maintain the life of the whole, and thereby themselves.

Application
to mind.

§ 34. *But does development apply to mind as well as to organic life ?*

Mind is an
organism.

1. In the first place, *mind is itself a kind of organism*. For in mind, in its mature state, we find a complicate system of ideas and feelings, powers and capacities, which support each other reciprocally, and are connected together, and made to work together, by a single self, so as to constitute the *unity in plurality* which we call mind.

Thus mind would seem to be an organism in much the same sense as the body is ; for the plurality of ideas and powers are pervaded and held together, and made

to work together for a single end *by the self, which is conscious of (and realizes itself in and through) them, in much the same sense as the organs and processes of the body are pervaded by the life of the whole.

2. *But does mind grow and develop in the same sense as the organism does?* In considering this, we must pass over the question, whether mind originates by continuous development from the life of the organism, a question of metaphysic and philosophy ; and begin with the lowest forms of consciousness ; and consider whether the *transition from the lowest to the highest, forms is of the nature of a development.* Now we shall find that in mind there is a gradual differentiation and integration of capacities and faculties, corresponding to that of organs and functions in an organism.

(i) For it is probable that in its lower forms, as in the worm or mollusc, or even in the human infant, consciousness amounts to nothing more than a vague discrimination of pleasurable and painful ; and therefore, where there is so little intellection, *feeling* itself will be very faint ; and *conation* will be only of the reflex and automatic kind.

(ii) At a higher stage, *intellective* power will rise to discrimination of organic and tactuo-muscular *feelings* as hunger and satiety, hot and cold, light and dark, motion and rest ; and the *movements* to avoid what is Painful will become more complex in proportion as the feelings become such.

(iii) Then the *sensations* of different senses will gradually become explicit, and different sensations of the *same sense*. And as the sensations become more distinct and intense, so the effects or traces of themselves which they leave in the system will become more distinct also ; and thereby *memory and anticipation* of the future will begin to assert themselves, though at first in purely automatic forms ; and *conation* will rise into adaptation to the future.

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CHAP. VIII.

Grows by
differentia-
tion and inte-
gration from
within.

Through suc-
cessive
stages.

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CHAP. VIII.

Rising into
thought, feel-
ing and voli-
tion.

In one inter-
grated sys-
tem.

And is there-
fore a product
of develop-
ment.

Different
stages of
development.

That of the
individual—
psychologi-
cal.

(iv.) Finally, intellection, will rise into *understanding* with its distinction between self and not-self, and its power of interpreting sensations as implying things in place and time ; and along with the power of *thinking* the past, distant and future (reason), will come the higher feelings called *emotions*, rising out of ideas and beliefs concerning past and future ; and with powers of thought and emotion together, come gradually the power of *purposive action*,—i. e. of foresight and intentional adaptation to the future, which is *will* proper.

Thus mind gradually becomes a complicate system of powers, intellectual, emotional, and volitional, with their products, e. g. ideas, beliefs, emotions, habits ; and as these factors differentiate out of a common source, so they continue to *depend on, and influence each other reciprocally* ; so that none would be possible without all the rest, and every change in one of them changes all the rest.

It is evident, therefore, that *the individual mind is an organism as much as the body is, and undergoes similar development by differentiation and integration of parts and functions*, realizing and keeping up the same unity in plurality—a unity of mind corresponding to the unity of organic life. And indeed the principle of organization and development may be carried beyond the individual mind, and applied to *collective or objective* mind, i. e. to communities or societies. For society also can be shown to be an organism, differentiating and integrating its branches and functions in much the same way as the individual body and mind do but with this difference, that it never attains to the same individual unity in plurality, which characterizes the mental life of the individual.

But there are in reality three kinds of development which fall within the range of mental science—

(i) *The development of the individual mind from infancy to maturity.* Psychology is especially interested in tracing the development of the intellectual powers, and æsthetic and moral sentiments in the individual, and the conditions and laws to which it is subject ; in

order to be able to suggest the best rules and methods for promoting the education of individuals. And one of the applications of experiment from which much has been expected has been to determine the progress of intellectual development in children.

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CHAP. VIII.

(vi) *The mental development of the human race* from its earliest condition down to the present.—It is now generally believed that at a very remote period, even the races which are now the most civilized lived in a condition, intellectual, moral and social, not superior to that of the lowest savages now; and that they have risen to their present condition by a process of mental development. Men, it is believed, gradually acquired new powers and capacities in their struggle for self-preservation; and these were gradually registered in the structure of the brain and mental system, and handed down by inheritance, and thus went on accumulating from generation to generation; so that men are now born with mental powers and capacities latent in their nature, which were acquired by ancestors during the past history of the race. And along with the development of subjective mind, goes the development of objective institutions and products of mind; social customs, forms of government, religion and the like. The study of development in this sense belongs especially to the mental science called sociology, and has an important bearing on the question of the origin of the ethical sentiments also.

That of the
human race—
sociological.

(iii) *Mental development in the animal kingdom as a whole*.—In the lowest animal forms—even in the amoeba and bell-animalcule—the beginnings of mind are discernible (whether it be conscious mind or not). In other words, their movements cannot be explained by physical and chemical processes alone. And as species rise in complexity, their mental states become more complex—especially when life begins to be concentrated in, and regulated by a nervous system, (e.g. in higher mollusca and insects), and still more when the nervous system itself begins to be more completely centralized in a single brain (e.g. in birds and mammals).

That of the
world of
living beings
—biological.

The question of a real continuity of mental development in animals is bound up with the further question, whether organisms have originated by continuous development from lower to higher forms (as argued by Darwin): and belongs therefore to biology and philosophy.

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CHAP. VIII.

Forces contributing to development.

The mental principle itself.

Inherited powers and capacities.

The question whether the human mind could have originated by continuous development from animal mind, (as Darwin maintained), or supposes an absolutely new and distinct beginning (as most think), is a question of metaphysic and philosophy.

§ 34. To discover the laws and methods of mental development therefore is among the highest results aimed at by mental science; but it is easy to state even at the outset *the general conditions, forces, factors, which combine in producing development in the individual mind.* These will come under two heads, *internal* and *external*.

I. The *internal* and *subjective* conditions will include (a) *the existence of the mental principle itself, with such latent powers and capacities as make it to be mental, i.e. capable of developing into actual mind.* For development or evolution is only an *unfolding* of what is already potential, a making explicit of what is already implicit. A particle of sand cannot grow into an oak tree—only a germ can, in which the form of the tree and the power of realizing it are already present potentially. Hence the impossibility of conceiving a development of mind out of matter, because the more we discover about matter, the farther removed do we find it to be from anything mental. And hence it is necessary to suppose, at the very beginning of development, a principle which is already at least *potentially* mental.

(b) And to this fundamental attribute of being *potentially mental* from the beginning, we must add also, as another internal factor, *those powers and capacities which the individual mind inherits from parents and ancestors*—powers which have been acquired originally by experience, and in the course of many generations have become engrained in the nature of mind by habit, and transmitted by inheritance, accumulating from generation to generation down to the present.

(In other words the kind of development described in (§ 33, ii) must be admitted at least to some extent).

II. The *External conditions* will include—(a) The *physical organism and nervous system* in and through which the mental principle realizes and manifests itself as mind. 'As mental and physical powers and processes correspond with and run parallel to each other, and affect each other reciprocally in their development and working, so they would seem to correspond in inheritance also.' Hence in inheriting the powers and tendencies of mind which our ancestors acquired by experience and habit in the course of many generations, we inherit also the cerebral and bodily structure which they acquired along with them.

But the development and healthy working of organic structure is dependent on physical forces acting both from within and from without (as well as on life and mind operating within); and the internal and external physical conditions which influence the development of organism will influence that of mind also. Hence also—

(b) The *external physical environment* in the midst of which the organism and mind develop, and which will include the climate, soil, and products of the country, and the character and abundance or scarcity, of the means of subsistence.

These conditions will influence the mind in two ways—(1) they will promote or hinder directly the development of the organism, and thereby also that of mind; and (2) they will call forth and exercise all the latent and potential powers of the mind, *intellectual and conative*, in order to preserve itself against the forces of nature, and turn them into instruments for its own benefit. And finally—

(c) The *social environment*, or minds and mental products to whose influence a particular mind is subjected from birth: This factor will include (1) parents, relatives, teachers, and companions, with their characters and accomplishments, ideas, manners, and habits; (2)

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Organic
conditions.

Physical
conditions.

Social
conditions.

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the customs and institutions, enlightenment or ignorance, civilization or barbarism of society ; (3) the laws of the state, and ideas, beliefs, and feelings embodied in language, literature and art.

For every mind receives most of its ideas and beliefs from, and has its feelings and activities excited or repressed by other minds, either directly through word and example, or (in civilized society) indirectly through the permanent products of mind in literature art, law, and institutions.

Hence, the question, what a particular mind will develop into, will depend on the co-operation of the above four factors ; and the character of mature minds will depend on, and vary with these factors.

Mental science, then, aims at discovering the laws of the development and working of the mental powers and processes. Hence it is desirable to determine here the precise meaning of *law*.

IX. LAWS OF MIND.

Science aims
at general
truth.

§ 35. (Science aims at a knowledge of general truths, *i. e.* of truths which are not merely true of particular things *here* and *there*, and *now* and *then*, but true universally of all things of the same kind.) A collection of particular statements about particular things may supply data or premises for scientific inductions, but is not itself science. Thus a dictionary, or a work on geography or history, being only a collection of particular facts, is not usually considered a scientific work, however minute and accurate it may be. But when the philologist, from the facts contained in dictionaries, tries to discover the general laws (such as Grimm's Law) according to which words and idioms change, and new languages differentiate ; and when the geologist, from known facts concerning the composition and form of the earth's crust, seeks to infer the causes at work in its formation ; and when the his-

torian seeks to derive from his data the general laws which govern the prosperity and decay, rise and fall of nations—then their inquiries rise into science.

The reason for this is, no doubt, that a particular truth may express what is merely superficial and accidental—arising out of a casual and temporary combination of circumstance. A general truth, on the contrary, arises out of something which is *general* or *common* to a whole class of things, and therefore *fundamental* and *essential* to their nature. Hence, to say that science aims at general truths is equivalent to saying that the knowledge at which it aims is *knowledge of what belongs to the essential nature of things*, and therefore manifests itself generally; as opposed to what is merely superficial and occasional, and therefore manifest itself only occasionally.

So, in the case of mind, an enumeration of the mental characteristics of individuals, however minute and accurate, is not science of mind. Psychology becomes science only when it begins to determine general truths which are *true of all minds alike*, and not of a single mind here and there; and which for that reason must be understood as *expressing what is true of the essential nature of mind as mind universally*. In other words, it aims at discovering the *Laws of mind*.

The historian may penetrate into, and describe profoundly the mental characteristics of Elizabeth or Napoleon, and the novelist or dramatist may express very fully and accurately the inner natures of his personages; but this, though sometimes called psychology, is not the *science* of psychology.

Now the term *Law* in its original sense has reference to *conduct*, i. e. to voluntary actions of persons; and means a *general proposition expressing a general form or standard of conduct*, imposed upon persons from without (whether by heaven, or by the state, or by the established customs of society); and to which all persons are required to make their actions conform, and which are conformed to, not *necessarily* indeed, but at the risk of penalties in the case of neglect—Thus, e.g., the ten commandments, the

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CHAP. IX.

Why?

If there is science of mind there must be laws of mind. ?

Original sense of law.

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Application
in physical
science.

laws of the twelve tables, the laws of Manu, the law of inheritance, are laws of conduct in this sense.

From this it has been extended in science to mean *a general proposition expressing the way in which all the things of a class must necessarily behave, in conformity with something known or unknown in their own essential nature (and with that of the other things with which they may be brought into relation)*, and therefore expressing a form of action which arises necessarily out of the essential nature of a class of things, and is therefore true of things of that class universally, and can for that reason be expressed in a general proposition.

Thus, law in its literal political sense, is a proposition expressing a form of action prescribed to persons by external authority, according to which they may *voluntarily* regulate their actions; but law in the *scientific sense* of the word, is a general proposition expressing a form of action to which things *necessarily* conform, in consequence of something fundamental and essential in their nature.

Thus such propositions as—"every particle of matter draws every other particle towards itself with a force proportional to its mass, and inversely proportional to the square of its distance"—"every planet moves in an elliptical orbit"—"its radius traverses equal areas in equal times"—"all iron is liable to be decomposed by oxygen"—"all mammals are air breathing animals"—"the same cause always produces the same effect,"—*etc.* are scientific laws of nature. They are propositions expressing the way in which things are known to behave under certain relations to other things; although it may be unknown what it is in their own nature, or that of other things that makes them behave so.

Distinctions
of law and
cause.

Hence the *law* according to which an event takes place (*i. e.* a thing behaves) is not to be confounded with the reason or *cause* of the event. The cause is the force, or the source of the force (the "something in the nature of the things") which produces the event, or makes the thing behave so and so. A statement of law merely answers the question, *How?* *i. e.* gives the form which actions always take under given circumstances. A statement of cause answers the question, *Why* do they always take this form? Thus the law of gravitation describes how the sun, planets and other material bodies behave in relation to each other, but it does not explain

what it is that makes them behave so. Newton himself though he demonstrated the law could not give the cause of gravitation.

§ 36. Now if we apply the idea of law to mind, we find that there are four kinds of mental laws.

(a) There are what may be called *Psychological Laws*, arising apparently from the essential nature of mind, so that mental processes necessarily conform to them because they are mental. They may be defined as *general propositions expressing what is true of mind, or rather of particular classes of mental processes and products, not in particular cases merely, but universally under the same circumstances; and therefore expressing what is fundamental and essential in the nature of mind.* Thus such propositions as the following will be laws of mind—

"Every state of consciousness involves discrimination"—"every mental process has an organic process corresponding to it"—"to make a sensation increase in arithmetical progression, the stimulus must increase in geometrical"—"every perception supposes a sensation"—"language is necessary to abstract thought"—"all emotions suppose ideation"—"all voluntary actions rise out of desire"—"all volitions are determined by motives"—"all influences tending to increase the vitality of the system are pleasurable"—"things occurring together in experience become associated in idea"—"similars and opposites tend to suggest each other," "pleasure is a mean between two extremes."

Such propositions as these express general truths, which are general, not by chance, but because they spring out of something in the essential nature of mind, and are therefore *laws of mind*; and to discover such general laws is the object of psychology as a science.

(b) But there are also *Logical Laws*. These apply to the intellectual processes by which mind seeks to attain true ideas about things which do not come

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Application
to mind.

Psychological
laws.

Ex.

Logical laws.

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within the range of actual perception, *i.e.* to processes of reasoning. And they may be defined as *forms to which the reasoning processes must conform, if they are to attain the end at which they aim, viz. truth.* They are laws, however, which are not always or necessarily conformed to. We often violate them in reasoning, and arrive at results which are not true. We may syllogize without making sure that all our middle terms are distributed.

Moral laws.

(c) And there are also *Moral Laws*. These apply to voluntary actions ; but they are not laws to which they necessarily conform, but to which they must conform if they are to be good in themselves, and consistent with the highest well-being of the agent.

Political laws.

(d) The above kinds of law have their ground in the nature of things independent of men. But there are also *political* and *social* laws, which are created by men themselves, and are conformed to, not necessarily, but from a sense of their utility or from fear of punishment ; and it is from these that the word *law* is derived literally (what is *laid down*, and *prescribed*).

PART IV.

MENTAL ACQUISITION.

X. COGNITION IN GENERAL.

§ 37. By *psychology of cognition* is or *intellection* meant the investigation of those mental processes by which we obtain our knowledge of the things and qualities and relations of things, both mental and material,* which make up the world; or, in other words, of the process by which mind evolves or reconstructs within itself (*i.e.* in terms of its own consciousness), a system of ideas corresponding in order and connection to the world of reality independent of its consciousness.

It means, therefore, the psychology of the intellectual powers, and is therefore the experiential side of epistemology, or theory of knowledge. For theory of knowledge, we have found, may be either experiential or metaphysical. As *experiential*, it consists in analysing the ideas and beliefs which we have formed in the course of our experience; and seeks to understand how they have been formed. As *metaphysical*, it endeavours to determine how far the ideas which we thus form in terms of experience (phenomena) can agree with realities as they are in themselves behind the phenomena in which they manifest themselves. Thus, what the contents of the common ideas of matter and the material world are, and by what processes the ideas are formed, are questions of experiential psychology; but how far these ideas agree with things as they really exist independently of our experience, is one of metaphysic.

We are concerned here only with the experiential side of the inquiry—the intellectual processes by which our ideas and beliefs are formed—and with regard to this we have to note first *the principal condition (on the subjective side) of attaining knowledge*; then *the essential*

PART IV.
CHAP. X.

The psychology of cognition.

Theory of knowledge.

Questions coming under the psychology of intellect.

PART. IV. CHAP. X.	<i>factors</i> which enter into all the processes of knowledge ; and then <i>the different stages in the application</i> of the knowing powers, or the <i>intellectual faculties</i> .
Condition of knowledge—attention.	I. <i>The principal mental condition</i> of attaining knowledge (apart from the possession of the intellectual powers themselves) is the power and exercise of <i>attention</i> which consists in <i>applying effort of will to the intellectual activities</i> , to control, direct, and concentrate them upon particular objects of observation and thought—things and ideas—in order to discriminate them, and their relations more clearly, to understand them better, and fix them more deeply in memory. • •
A branch of volition.	Without such power of self-concentration upon things, the impressions made by things would be superficial and useless for purposes of knowledge. Attention however belongs to the function of volition, and falls for consideration under that head.
The essential factors of intellectual work (§ 30).	§ 38. II. Again there are certain <i>factors which enter into all the intellectual processes</i> , and appear in all the different forms and stages of intellectual work, and which we have already found to be reducible to the three heads of <i>discrimination, integration, and understanding</i> . Thus—
Discrimination.	(a) All intellection involves <i>discrimination</i> .—We have found that consciousness is subject to the <i>law of relativity</i> which supposes differences of state, and a continual distinguishing of differences. A continuous homogeneous state could not enter into consciousness at all. The intellectual activity involves a continual effort to penetrate into, and differentiate whatever comes before it, because it is only by discriminating differences that it can remain conscious. And the discovering of differences, we have found, is always accompanied by <i>assimilation</i> , in the sense of discerning similarities, (which is the basis again of <i>assimilation</i> as an <i>integrating force</i>).
Integration.	(b) All intellection involves <i>integration</i> (which is also <i>conservation</i>)—while the law of relativity requires us to

distinguish and contrast things and their qualities, knowledge requires us to consider them, also in their connection with each other, *i.e.* to combine (integrate) them together into ideas and systems of ideas, corresponding to the order of things and qualities of things in nature. And integration appears under the two forms of—

Association, by which things and qualities of things, which have been experienced together in nature, become connected together in the mind into one complex idea, so that we never think of one without thinking of all the rest, *e.g.* the form, touch, colour, taste, and smell of the fruit—(the process by which ideas are connected together in such a way as to be retained and revived in memory); and—

Assimilation (as a combining force), by which many different ideas, when they happen to have essential attributes in common, become amalgamated together in thought into one *general idea*, in which superficial differences are eliminated, and what is fundamental and essential is retained—(the process of generalization or conception, which makes thought possible by reducing the unthinkable multiplicity of particular ideas to a moderate number of *general ideas, or concepts*.)

(c) Finally, all *knowledge involves understanding*. Intellect or cognition itself is something more than a mere discriminating and adding together of sensations. To the sensationist maxim: "there is nothing in intellect which was not previously in sensation." Leibnitz added the qualification, "*except the intellect itself*." By this he meant that it is not enough for purposes of knowledge, that mind should have sensations impressed upon it; it must also have the power of *understanding and interpreting their meaning*. Animals have sensations, and often *finer discriminations* of sensations than man; and yet they have little that can be called knowledge. And understanding implies at least this much—that in having feelings and sensations, we understand these as *functions and manifestations of something* which we think of as substance or reality—thereby arriving at a conception of a world of

PART IV.
CHAP. 5.

Which is the
ground of
memory.

And of gener-
alization.

Understand-
ing, which is
cognition
proper.

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CHAP. X.

things, as distinguished from sensations and feelings in the abstract.

But the questions involved in *understanding* or *reason* require a deeper study of "the theory of knowledge" than is attempted in ordinary psychology; for the question of knowledge branches out into so many connected questions, that it comes to be practically identical with the problem of metaphysic itself: what must we be in order that we may know the world, and what must the world be in order that it may be known by us?

The stages of
intellectual
work (p. 70).

1907

Acquisition
of materials.

§ 39. III. In rising from elementary feeling to knowledge, the mental activity rises through certain stages of intellectual work, which though really contemporaneous, and contained as factors in one complex process, may be treated as if they followed each other successively, according to their order of logical dependence. These are spoken of as the *intellectual faculties*, and include—

A. *Presentation and Acquisition*—the process by which we become aware of the existence of things, and of the qualities and relations of things, as immediately *presented* to us in experience. This presentation of things to the mind supposes first—

By means of
sensation.

(i) *Primary feeling, affection, or sensibility*, which is the self's consciousness (in the form of sensations) of the changes of state which are imposed upon it by its own activities of self-preservation and the reaction of the surrounding world. It is only through being thus *affected* that it can attain to consciousness; and it is only through such conscious *affections* or *sensations* that it becomes aware of the existence of itself as the subject of them, and of other things as the causes of them. But sensation is only the means or material; presentation itself consists in—

And percep-
tion.

(ii) *Perception*, or the activity by which the thinking principle *interprets* or *understands* its feelings and sensations, and thereby comes to know through them (as phenomena) the existence of the realities which manifest themselves in them; and which therefore includes—

Internal perception, or *self-consciousness*, in which the self cognizes, in the midst of its own, changing states, the reality of itself as the permanent subject of them ; and

External perception, in which the self comes to *understand* these states of itself called sensations, as imposed upon itself from without ; and to *interpret* them as the manifestations of a world of things extended in space, and therefore external to itself ; and thus arrives at the idea of, and belief in, the material world.

It is to be observed that though sensation comes properly under the department of feeling in the sense of affection or passive consciousness, yet the dependence of intellect upon sensation, as the material of knowledge, makes it necessary to study sensation in connection with intellect.

B. *Conservation and Representation*, or the processes by which the past experiences of the self are retained, and afterwards reproduced in the form of mental representations, images, or ideas ; which takes the forms of—

Conservation
and repro-
duction of
materials.

Memory, in which past experiences are reproduced in the same form in which they were experienced, and—

Construction in which materials preserved by memory are taken asunder and recombined again into ideas of things different from any that we have actually experienced.

It is to be observed that memory and construction are sometimes included under the common name of *imagination*, *i. e.* thinking in concrete mental images ; though in common language the word imagination is limited to construction. And finally thought rises in

C. *Elaboration or Logical Thought*, the processes by which we apply the truths already obtained by perception, and preserved and reproduced by memory, as means by which we reach out to other truths not given by perception, *i. e.* to truths concerning past, distant, and future things ; and thereby arrive at last at some understanding of the world as a whole.

Rising into
reasoning.

This stage therefore includes the process of *reasoning*, and the processes subservient to it, *vis. judgment and conception*.

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CHAP. XI.

The analysis of these processes as they actually go on in the mind comes under *psychology*. The art of using or applying them in such a way as to arrive at true ideas of things belongs to *logic*; and the question whether and in what sense ideas which are true in the experiential sense can be held to correspond to things as they really are in themselves independently of our sensations and ideas, is the question of *metaphysic*.

The knowledge thus acquired enables us to guide actions in the way most conducive to our own highest well-being, which is the highest end and use of intellect.

XI. PRIMARY FEELING.

What is
sensation?
Different
definitions.

§ 40. To define sensation, we may assume a knowledge of the relation which psychology has discovered, between sensation and organism, and say (a) that sensations are *those states of consciousness which are found to be occasioned directly by corresponding states and processes of the organism, and indirectly by states and processes of extra-organic things affecting the mind through the medium of the organism*. But as we know what sensations are, without knowing anything about their relation to organism, it is more logical perhaps to define them (b) as *those states of consciousness which carry with them the conviction that they are occasioned by something other than the conscious self; or as those conscious states of self which carry with them the belief that they are occasioned by corresponding states of something which is not self*. They are states, therefore, in which the self feels itself to be comparatively *passive*, i.e. to be *acted on* and *affected*, and is therefore led to think of something which is not itself, as occasioning these states.

For the widest distinction that comes within the sphere of consciousness is the difference between *acting* and *being acted on*—*activity* and *passivity*. Hence at one extreme of the field of consciousness we have

sensations, in which we feel ourselves to be acted on by other things, and to be ourselves comparatively passive; and at the other extreme, we have volitions, in which we feel ourselves reacting upon other things, and therefore active.

It is to be remembered, however, that there is no such thing as *pure passivity* or *activity*, nor therefore pure sensation or volition, i.e. states of consciousness in which we are conscious of being acted on, without reacting, or of reacting without being acted on. Action and reaction must always be present together in some degree, and must enter into consciousness together; but at one time passivity predominates, giving sensation, and at another, activity, giving volition.

It may be observed that the first of the above definitions defines sensation, by reference to organism and external world, and therefore from the stand-point of the objective method. And the objective definition given above may be made more elaborate by borrowing details from physiology, and saying that sensations are *those states of consciousness which are directly occasioned by, and correspond to physical processes in the brain-centres, caused by physical forces acting on the outer extremities of incurring nerves, and thereby sending currents of nerve-force inwards to the brain, and causing changes there.* But such definitions of sensation by reference to organism may be objected to logically, as involving the vicious circle; because we have elsewhere to define organism and external world by means of sensations (through which alone we know them). The second definition avoids this objection by defining it wholly from the subjective point of view; without assuming any knowledge of organism.

Sensation has also been defined as "*the consciousness of certain affections of our body as an animated organism.*" But it is not a consciousness of states of body, but of mind. We come to understand that it has its ground in a corresponding state of body; but we must distinguish between the bodily state (some unknown process of nerves and brain chiefly), and the mental state resulting from it which is the sensation itself.

Hence, the marks which distinguish sensations from other modes of consciousness are mainly these, (1) that they are *passive states or affections* (in which they agree

Peculiarities distinguishing sensations from other affections.

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with the emotions); and (2) that the initiative in the production of them comes from *without* the mind (and not from *within*, as in the case of the emotional states). The mental principle must indeed be concerned in the production of them (for the same physical forces would not produce sensation in an inanimate object where there is no mind to receive them), but its part is only that of *compulsory, involuntary reaction*; whence we feel the sensation to be *imposed and forced upon us from without*. And (3) that, while the mind carries its *ideas* and *emotions* about with it everywhere (as its own property so to speak), its sensations depend wholly upon external circumstances over which it may have no control; and are therefore thought of as dependent on an external world—so much so that in some cases we fall into the habit of thinking of our sensations not as states of our minds, which they really are, but as states or qualities of external things as *e. g.* we think of colour and heat as seated in external things.

Importance
of sensations
in cognition.

Hence *the function and importance of sensations in the economy of mind* consist in this, that they both reveal to us the existence of a world of reality outside of us; and supply us with materials for constructing *within* our minds a conception of the world *without*—*viz.* that *mental* representation of an *extra-mental* world which we call knowledge.

For, being states and processes of self occasioned by states and processes of not-self, they reveal, by their own existence, the existence of a not-self; and by their modes, qualities and degrees they reveal the modes, qualities and degrees of the not-self, *i.e.* of the external things which occasion them. For the qualities in general of things are their powers of causing effects in other things (their manifestations or phenomena); and their qualities in relation to us are their powers of occasioning sensations in us; and are therefore manifested to us in our sensations. Thus the fire melts the ice (objectively), and occasions in us (subjectively) the sensations of heat and light, by

which we know it and its properties. *Knowledge of things therefore is the interpreting and understanding of sensations.*

§ 41. But sensation is not an altogether simple mental state. Things produce *an impression or direct effect on the mind through some special organ*, and it is this effect, which the thing *directly* produces, that corresponds directly to the quality and degree of the thing. But this impression directly produced by the thing, produces again further effects of its own upon the organic and mental system as a whole. These secondary effects are beneficial or otherwise, and, entering into consciousness along with the sensation proper, *make it to be felt as agreeable or disagreeable, pleasurable or painful*. Hence the two elements already distinguished as contained in every sensation, *viz.*—

(a) The *presentative element*, or that element of the sensation which corresponds most directly to the form, quality, and position of the extra-mental thing ; and which is clearly distinguishable from the presentative elements of other sensations, representing other qualities of things. This distinctness may be explained by supposing that the presentative element is, in so far, an affection of a *particular part* only of the system, and for that reason clearly distinguishable from affections of other parts. And—

(b) The *general affection, æsthetic tone* or feeling of pleasure or pain accompanying the former ; which *probably* arises from the way in which the impression from without affects the whole system for better or for worse. And these two elements stand to each other in something like *inverse ratio*. For the more the system as a whole is agitated, pleasurable or painfully, the more general and indefinite is the affection, and the less the knowledge derived from it.

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CHAP. XL

Elements
contained in
sensations
(§ 29.)

They correspond in part
to external
thing.

They are in
part purely
subjective.

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Hence it is only the former and more definite elements of the sensation, that we can use as materials for our representation of the world. The accompanying pleasure or pain we cannot possibly think of, as representing anything in extra-mental things. It is purely *subjective* without corresponding to anything *objective*; and by itself gives no element of objective knowledge. It is not a *presentation*, or mental equivalent of anything extra-mental, but only feeling; and is sometimes spoken of as the *tone* of the sensation.

Thus, when I come upon a fine flower, there are present to my mind (1) the *definite impressions* of colour, form and smell, which enable me to know that it is a flower, and of the kind called rose or lily; and (2) the exhilarating *feeling of enjoyment*, which the colour, form and smell together excite in me. Hence—

We may proceed then to classify those *presentative elements*, or *distinguishing characters and differences of sensations*, which reveal and represent to our minds the characters and differences of external things?

The qualities of things are essentially *powers*, through which they affect other things and influence the mind in different ways and degrees, thereby giving rise to corresponding states of consciousness, which *present* (or rather *represent*) the things and their qualities to the mind. Now every impression or sensation thus produced will force itself into consciousness, and impose itself upon the attention, with a certain *intensity* or *degree* of force; will be of a certain *kind*, or have a certain *quality* of its own, differentiating it from other kinds of consciousness; will have a certain *duration* in time; and will occupy a certain *extent* (so as to speak) of the field of consciousness; and, in so far as it corresponds directly to an affection of a particular part of the organism, it will be capable of reference to, and *localization* in that part. And these distinguishing characters of the sensation will correspond to distinguishing characters of things, and be the means of revealing them to mind. These differences may be classed under two heads, *quality* and *quantity*, of which

Analysis of
the know-
ledge giving
elements.

the most fundamental is quality, because quantity is only the amount or degree in which some quality is present. Thus:—

I. Sensations *differ in quality or kind*,—for they correspond to external forces, and these differ not only in degree but also in *kind*. There is an essential difference of kind between the luminiferous ether and the atmosphere, and therefore between their vibrations also; and between the impact of solids on the surface of the body, and the chemical actions of liquids and gases on the tongue and the nasal membranes, and so on. And the organs adapted to receive and transmit these different forces (the eye, ear, skin etc.) also differ. Hence, the sensations to which they give rise will differ in the *kind*, as well as in the *degree*—in the *quality* as well as in the *quantity*—of the consciousness which they contain. Thus, taste is a different *kind* of consciousness from sound, and sound from colour. And of these qualitative differences of sensation—

(a) Some will be *generic* and fundamental, corresponding to different external forces, and different organs for receiving them, *viz.* the sensations of the different senses, colour, sound, taste, etc., while—

(b) Others will be *specific* only, corresponding not to different forces, but only to different modes of the same force and organ; *i.e.* to the same force and the same sense—operating in different ways, and giving the *different sensations of the same sense*. Thus different colours are produced by the same external force, operating through the same organ; and the same is true of different sounds, tastes, etc.

Hence, *generic* differences are occasioned through the operations of different organs, and nerves. Now it is a question whether the nerves of generically different senses are themselves different in structure; and each therefore capable of conveying only one kind of sensation, even though it should be stimulated in different ways. According to the theory of “the specific energies of the nerves,” each nerve is capable of conveying only its own peculiar kind of sensation, even though different

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Different
“qualities” of
sensation
giving quali-
ties of exter-
nal things.

Specific.

And generic
differences.

stimuli should be applied to it. Thus, it is said, the optic nerve gives always a sensation of light, not only when acted on by the ordinary stimulus of light, but when affected by a blow on the head, or by an electric current. The other, and more probable view is that the different sensations are due mainly to differences of stimulation and that different stimuli applied to the same nerve would produce different sensations.

Specific differences again are produced by different operations of the same organ and nerve. It comes, then, to be a question of interest, how the same organ operates so as to produce different modes of sensation. Two ways are possible:—

How produced.

(i) It is possible that, of the many thousand of nerve fibrils which are comprised in the nerves of the different senses, some may be adapted to producing one form of the sensation, and others to producing another form. Thus, in the optic nerve (containing some 240000 fibrils), some may be adapted to receive and carry the vibrations which produce the sensation of greenness only, others that of violet, and so on. In other words, there may be *specific* differences of the *fibrils* themselves; and the theory of specific energies is thus applied to the nerve-fibrils.

(ii) It is possible that the nerve-fibres of the same sense are themselves specifically similar, but capable of functioning or operating (vibrating) in different ways, when subjected to different kinds of stimulation, thereby occasioning sensations of different specific qualities.

Many favour the former hypothesis, and it is assumed in Young's theory of colour—that there are three fundamental colours, red, green, and violet, and that they are produced through three specifically distinct kinds of fibrils contained in the optic nerve,—the other colours being produced by the simultaneous stimulation of different kinds in different proportions. It receives some support also from what is called the *local character* of touch-sensations. It is found that touches differ somewhat in kind at different points of the surface—which seems to show that the ultimate fibrils of the touch-nerves differ in quality.

§ 42. II. Again sensations differ in *quantity*, because qualities differ from each other in *intensity* or *degree*, *extension*, and *duration*, and these are modes of quantity. Quantity will therefore have the three forms of *intensity*.

extensity and *duration*, or, as they have been named, *intensive*, *extensive*, and *protensive* quantity. (There is this anomaly in this arrangement, however—that extension is not an attribute of sensations in the same sense as intensity and duration, but is one of the external grounds of sensation; sensations are faint or strong, long or short, but are not *extended* things). Thus—

(a) Sensations differ in *intensity* or *degree*: we feel the difference between sun-light and moon-light, a flash of lightning and the spark of a fire-fly, the report of a cannon and the rustling of a leaf; and we know that this *subjective* difference of the mental affection corresponds to an *objective* difference of the extra-mental force, and therefore of the thing from which it proceeds—some difference of power, magnitude, or distance.

The first and most important attempt to apply measurement of degree to mental processes (psychophysics) was in the case of sensations. How can it be done?

Though differences of degree are obvious enough to introspective observation, yet they are not susceptible of precise measurement by introspection alone. This is accomplished, however, by combining an objective standard with introspective observation. Thus we can apply finely graduated series of external stimuli to an organ of sense and observe their effects upon the degree of sensation produced, noting what increase of the stimulus is needed to produce an increase of the sensation, and thus subjecting the latter to an objective scale of measurement.

Thus, different degrees of pressure or weight may be applied to the hand, different infusions of a soluble substance to the tongue, different degrees of atmospheric vibration to the ear, and so on; and the way may be observed in which these different degrees of stimulation affect the resulting sensations of pressure or weight, taste and sound.

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CHAP. XX.

Differences of "quantity" giving the quantity of external things, and including—

Intensity.

Measurement of intensity.

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of sensation.

The chief results arrived at by experiment of this kind have been the determining of the *lowest* and *highest* limits of sensibility and the *ratio* between the increase of sensation and that of stimulus.

(a) As to the *lowest limit of sensation*—it is found that the external force or stimulus applied to the organ must rise to a certain degree or quantity before it gives rise to any sensation. This point at which the stimulus passes over (so to speak) into consciousness is called the *threshold* or *liminal* intensity of the sensation, *i. e.* the degree of force needed to produce the lowest degree of sensation (the *absolute sensibility* of the organ being greater or less, according as the force needed to produce sensation is less or greater).

Thus, when the hand is laid on the table and successive objects laid upon it, the objects must reach a certain amount before they give rise to any sensation of *pressure*. When the hand is held out in the air, the objects must reach a certain weight before they give rise to any *feeling* of weight. Atmospheric waves must strike against the drum of the ear with a certain force before they give rise to any sensation of hearing, and so on.

The liminal intensity will, of course, differ greatly in different persons. And when the organ is a surface, as in the case of sight and touch, different parts of it are found to differ in sensitiveness.

(b) As to the *comparative rate of increase* of sensation and stimulus—when the stimulus is increased, the sensation is found to increase also, but not in the same ratio as the stimulus. In order to produce equal perceptible increments of sensation, *i. e.* to increase it by the *addition* always of a fixed quantity (or in an *arithmetical* progression), the stimulating force must be *multiplied* always by a fixed quantity (*i. e.* it must increase in a *geometrical* progression). From this it appears that the stimulus suffers obstruction somewhere on its way into mind, so that the sensation increases more slowly than the stimulating force. This is called *Weber's law*. (It is expressed

X Relation of
sensation and
stimulus.

also by saying that the sensation increases and diminishes as the logarithm of the stimulus).

The constant multiplier, however, is only one *plus* a fraction. Whence another way of stating the law is, that the stimulus must be increased always by the same fraction of itself, (the quotient of sensibility). It differs for different persons, and is the index of what may be called the *discriminative sensibility* of the sense, *i. e.* its power of discriminating differences of degree.

Thus, suppose the lowest perceptible degree of a sensation be n , and the amount of force needed to produce it (its threshold or liminal intensity) be 9, and the increase of stimulus needed to produce an increase of sensation be $\frac{1}{3}$ (or in other words, if the multiplier be $1\frac{1}{3}$); then, in order to produce an increase of feeling in the ratio, $n+1$, $n+2$, $n+3$, etc. the stimulus will have to be increased in the ratio 9, 12, 16, 21.3. etc. The experiment is made most easily in the case of sensations of pressure and weight. When the hand is laid on a table, and weights placed upon it (giving the sensation of pressure), then the weights have to be increased by $\frac{1}{3}$ to produce the least perceptible increase of the sensation. When weights are laid on the extended and unsupported hand (giving the feeling of weight), differences of $\frac{1}{4}$ are distinguishable. In the case of sound, we cannot distinguish an increase of less than $\frac{1}{4}$ in the stimulating force, but in the case of light we can discriminate an increase so small as $\frac{1}{100}$.

Where then, in the transition from the external stimulating physical activity to the resulting mental state, does the obstruction and retardation take place? (1) Is it in the brain, owing to the diffusion of the excitation over a wider area? Apparently not, for the excitation seems rather to be multiplied and increased in passage through the ganglia? (2) Is it then in the transition from brain to mind, from physical to mental? (3) Or is it within the sphere of mind itself and due to *relativity of judgment* (§ 21), the intensity of feeling already attained making it always more and more difficult to distinguish a further increase? These questions have not yet been conclusively answered.

(c) As to the *upper limit of sensation*,—notwithstanding the importance attached to Weber's law, it is

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Discriminative sensibility.

note

The upper limit of sensation.

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found not to be strictly true except of the lower and middle parts of the scale of degrees. In the upper parts of the scale, the increase of sensation becomes slower than is consistent with the law, and at a certain point ceases altogether. In other words, there is a point beyond which increase of stimulation produces no further increase of sensation. There are degrees of pain, sound, light, beyond which no increase of intensity is possible.

This point has been called the *height of sensibility* of a sense; and the interval between the *threshold* and the *height* is the *range* of its sensibility. It may be observed however that increasing the stimulus often changes the quality of a sensation, more than it increases its intensity. The change from shadow to sunlight is a change of quality as much as of intensity; that from a bass to a treble tone is one of quality alone.

The so called
extensiveness
of sensation.

III. Sensations differ also in what has been called *extensity*, *massiveness*, and *volume*. These terms are figurative, indeed, but they serve to express a difference which is obvious to consciousness. Some sensations have the appearance of filling the whole field or area (so to speak) of their sense (apart from the question of their intensity), and therefore of being *voluminous*, or *extensive*; while others have the appearance of being limited to a sharp point, and therefore of being *acute*, *i. e.* intense without being extensive. Thus, the diffused sunlight is *extensive*, though not intense; while the glare of an electric lamp is *acute*; the sound of the sea is *voluminous*, and that of thunder with its many echoes is voluminous as well as intense, while the screech of a parot is *acute*; the pressure of the water on the body of a swimmer is *extensive* while the prick of a needle is *acute*, and so on.

Local sensibility.

The feeling of greater or less *extensiveness*, properly so called, is closely connected with a feeling of *locality* also. For it is characteristic of those sensations whose organs are surfaces, *viz.* touch and sight; and is accompanied from the beginning by the power of *discriminating acute impressions on different points of the surface, i. e.* on

different points of the skin or retina ; and in connection with this, a power is gradually acquired (by experience) of referring such acute impressions to the point affected, i. e. of localizing them, and understanding their relative positions on the surface of the organ (discriminative local sensibility).

And the *local discriminativeness* of a surface-organ (skin or retina) is measured by the distance at which two acute impressions (two points of pressure, or of light or colour) can be discriminated from each other, and felt as two (instead of running together in sensation into one). The smaller the distance, the greater is the discriminative sensibility of the organ to locality, and the greater, therefore, its aptitude for *presenting* to the mind the *spatial* aspects and relations of things. *

The local discriminativeness of both the skin and the retina, however, differs in different parts of their surfaces, and depends probably on the degree in which the different parts are supplied with nerve-endings. It supposes also that the points stimulated differ not only in locality, but also to some extent in the *quality* of sensations to which they give rise. And differences of quality or kind among units of sensation, arising out of the locality stimulated, are called their *local character*.

IV. Finally, sensations differ also in *duration* in time—not merely in that duration which depends on the greater or less prolongation of their external cause ; but also in a kind of duration which depends on the nature of the sensation itself (or of the organic process out of which it arises), viz. its property of lingering in consciousness for a shorter or longer time after the external cause has ceased to operate. Thus, an impression of light or colour may be nearly momentary, the sensation ceasing almost along with the objective cause. But in most cases even of light and colour, and always when the light or colour is *intense*, the sensation lingers for some time after the extra-organic cause has been withdrawn as the sensation of light after looking at the sun. This is also the case with sound to some extent, and still more with taste and smell, which linger in consciousness and fade away gradually. Of all the sensations, touch

Duration of
sensations.

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has the shortest duration, and the most distinct beginning and termination.

The above differences therefore of quality, intensity, extensity (with locality), and duration may be taken as a classification of the main *presentative* constituents of sensation—those which give us our knowledge of the existence and attributes of the external world.

THE SENSES AND THEIR ORGANS.

Classification
of the sensa-
tions.

§ 43. It follows that the different kinds of sensation will depend on the different kinds of extra-mental forces by which the mind is capable of being influenced. These forces may be divided, according to their origin, into two principal divisions, *viz.* those originating from causes *within* the organism itself, and influencing the mind from *within* it; and those acting on the organism from *without* the organism, and influencing the mind indirectly *through* it by means of organs specially adapted to receive them. This distinction determines two main divisions of sensation, *viz.* into *organic* and *special*. But to these another division has to be added, in which sensation of the organic kind is combined with consciousness of an entirely different kind, *viz.* the consciousness of *effort*. These are the *muscle-feelings*. Hence we have to distinguish three main classes—*organic*, *special* and *muscular* sensations.

A. The Organic Sensations.

Organic sensa-
tions.

The organic sensations are those occasioned by forces originating inside the organism, and acting on the outer extremities of the incarrying nerves which terminate (without being collected into special end-organs) in the muscle-fibres of the limbs, and viscera, and under the surface of the skin, and in the inner surfaces of the digestive organs. Now these general *organic* nerves are affected—

Wounds and
diseases.

I. By *wounds, and diseases of particular parts* producing ingoing currents, and giving rise to painful sen-

sations, which can be localized with more or less precision in the parts affected. These are the sensations of cuts, burns, bruises, boils, and other sores, which are the source of great part of the acute pains of life.

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CHAPTER II.

II. *By the working of particular organs*, including both—

The working
of the organs.

(1) Their *normal and healthy working*, as, e. g., the alternate contractions and relaxations of the muscle-fibres and the friction of the joints in movements, affect the sensory nerves contained in them, and give rise to passive muscle-sensations—the source of the pleasures of physical exercise, and thereby of a considerable part of the happiness of life ;

(2) And their *disordered working*, as that of the stomach and liver in digestive disorders, producing painful feelings, only vaguely localizable in the organs which give rise to them.

III. And by the *physical condition of the organism as a whole*, affecting the nerve-endings *collectively*, and producing agreeable or disagreeable feelings not capable of being localized in any particular part. These are the *general or common feelings*, and include—

The common
or vital
feelings.

(1) *Hunger and thirst*, which seem to be general, though some have referred them to the stomach, or to the blood-vessels ; and

(2) Feelings of *weakness, fatigue, weariness and collapse*, and feelings of *drowsiness and repose* ; and their opposites, the feelings of *health, freshness, vigour*, and general *well-being*.

The organic feelings, therefore, will have these *characteristics* :—(1) Their nerves are not collected into special end-organs adapted to receive special kinds of influence, but are scattered through the tissues. Hence (2) the sensations themselves are vague, and not clearly marked off from, but shade into each other gradually, and therefore are often difficult to distinguish from each other. And (3) for the same reason, they are mostly difficult to localize ; the pain of an external sore can be localized definitely, but that of an internal disorder, only

Character-
istics.

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vaguely, and common feeling, not at all. And from these peculiarities it follows (4) that in them the representative element is at its minimum. The more clearly *local* ones reveal, indeed, the presence of hurts and disorders of particular organs ; and the *common* ones are an index of the rise and fall of vitality in the system as a whole ; and together, they constitute *a large part of the happiness, and the greater part of the miseries of life* ; but their importance is for feeling, as feeling, rather than for knowledge.

B. The Special Sensations.

The sensations of the "five senses."

§ 44. The *special sensations*, again, are those states of consciousness, which are occasioned by extra-organic forces acting on the outside of the organism, and affecting *end-organs adapted to receive special external forces, and to transmit them, by currents of nerve-force, along special lines of nerve to special centres in the brain.*

How they are produced.

Thus, the *eye*, with its focussing lens and its layer of retinal cells, is an organ specially adapted to receive the waves of the luminiferous ether, and to transmit corresponding waves of nervous vibration to the brain, giving rise to the special sensations of light.

The *ear*, with its vibratory drum and its winding shell, lined with nerve-cells and fibres is specially adapted to receive undulations of the atmosphere, and report them by corresponding neural waves to the brain, giving rise to the sensations of sound.

The *skin* is provided on its under-surface with a network of nerves ending in minute corpuscles, which are compressed by pressure from without, and, propagating the force inwards by tactual nerves, give rise to the sensations of touch.

The *nostrils* are lined with a layer of special cells which are affected by vapours and gases contained in

the air inhaled, and, by transferring their effects to the brain-centres, give rise to the sensations of smell.

The *tongue* is provided with a layer of specially adapted cells, which seem to be acted on chemically by soluble substances taken into the mouth, and thereby give rise to the sensations of taste.

Hence the special sensations will be distinguished from the organic ones (1) by their having specially adapted terminal organs to receive and transmit special extra-organic forces; (2) by the multiplicity of the degrees and qualities of their sensations, corresponding to different kinds of external force; (3) by the distinctness with which they can be discriminated from each other, and assigned to different sources and localities in the external world; and hence (4) by their *presentative* character, or aptness for representing, in terms of consciousness, the qualities, positions, and relations of extra-mental things, thereby becoming materials of knowledge.

Characteristics.

The next thing, therefore, is to consider the several *generically different special senses, with their organs and modes of operation, and the different varieties of sensation* to which they give rise. They are commonly reckoned to be *five in number*; but along with these five, it is customary to consider that peculiar form of consciousness known as *muscle-feeling*, which includes an element, at least, of passive feeling or sensation, though it appears to include also an element of very different origin. Hence we consider first the lowest of the sensations, *viz.* taste.

§ 45. I. *Taste* has its peripheral seat in the middle and posterior parts of the upper surface of the tongue, scattered over which are a number of projections, some flat-topped and, some conical, called *papillæ*. Inside the larger papillæ are small flask-shaped cavities, each filled up by a cluster of slender nucleated protoplasmic cells, laid over other like the rudimentary leaves in the *buds* and *bulbs* of plants. Hence these bundles of

Organ and sensations of taste.

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cells contained in the flask-shaped cavities of the papillæ, are called *gustatory buds* or *bulbs*. They give out nerve-fibres which run together and form the *gustatory nerve*, and are therefore the real organs of taste.

The process.

The nature of the process, however, is obscure; but appears to consist in a chemical reaction between the liquid or soluble substances taken into the mouth, and a liquid secreted either by the blood-capillaries, with which the papillæ are abundantly supplied, or by the cells themselves. The chemical process, whatever be its nature, affects the contents of the cells, giving rise to an ingoing current to the brain, and the resulting brain-process is accompanied by the sensation of taste.

Taste is, therefore, spoken of as the "chemical sense," and seems to be placed at the entrance of the digestive canal to test the composition of the substances admitted into the alimentary system.

The *pecially* different varieties of tastes are few in number, and generally mixed up with other sensations of *generically* different kinds, producing mixed sensations. Hence we have to distinguish between—

Pure sensations of taste.

1. The *pure* sensations of taste, of which there probably are not more than four that can be clearly discriminated from each other, *viz.* sweet, bitter, salt, and sour—if even these are not really reducible to two, *viz.* sweet and bitter; and—

Mixed sensations.

2. The *mixed* sensations, in which taste is mixed up with generically different feelings, and which include—

(i) Some in which taste proper is mixed up with organic feelings of the digestive system; because being placed at the entrance of the canal, the taste nerves work simultaneously with those of the throat and stomach in swallowing and digesting food; and hence the two kinds of sensation, being both vague by nature, become in many cases mixed up together. Thus, the feelings of *relish* and *disgust*, excited by some articles of food, are combinations of taste and organic feeling.

(ii) Some in which taste is mixed up with *tactual sensations*; for, besides being the seat of the gustatory bulbs, the tongue is, of all parts of the bodily surface, the most richly supplied with tactual nerves. Hence taste is always accompanied by tactual sensations, and

in some cases becomes mixed up with them indistinguishably, in one compound sensation. This is the case especially in what are called *acrid* and *pungent* tastes.

(iii) And some also in which taste is combined with *smell*, for, being excited often simultaneously and by properties of the same substance, and having their organs in proximity to each other, these sensations also will have a tendency to become fused together in many cases. Thus, what is called the *flavour* of foods and drinks is a combination of both taste and smell.

It follows from the vagueness of its sensations, and their tendency to intermixture, that taste will contribute but few presentative or cognitive elements, and therefore will rank but low as a knowledge-giving sense.

§ 46. II. *Smell* has its seat in a membrane lining part of the nasal cavity (the *olfactory* region), which is composed mainly of a layer of nucleated cylindrical cells laid horizontally, their outer ends exposed to the currents of air entering the nostrils, and their inner ends giving out nerve-fibres, which combine to form the *olfactory* nerve.

These cells are affected in different ways by the different vapours and gases contained in the air which is drawn in to supply the lungs; and the changes thus produced in the cells give rise to ingoing currents, and thereby to the brain-processes which give rise to the sensation of smell. Thus, the sense is seated at the entrance to the respiratory organs as if to test the quality of the air admitted. But the nature of the process by which gases affect the olfactory cells—whether it is a process of chemical reaction upon the contents of their outer surfaces, or a mechanical irritation of the cells—is uncertain.

The sensations of smell are numerous, but are so indefinite, shade into each other so gradually, and are so liable to intermixture with each other and with other sensations, that accurate discrimination and classification is impossible, and language has been able to find no

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Smell—its
organ and
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operation.

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Mixed sensa-
tions of
smell.

accurate system of nomenclature for smells. Thus they are specially liable to intermixture—

(i) With *tactual* sensations of the nostrils ; for some vapours, such as ammonia affect, not only the olfactory, but the tactual nerve-endings also ;

(ii) With *organic* sensations of the respiratory system ; for some vapours and gases have the affect of stimulating respiration, and others that of depressing and checking it, as impure atmosphere does, so that their smell becomes mixed up in consciousness with the organic sensations of the lungs to which they give rise ; and

(iii) With *common* or *general* organic feeling, as when vapours have the property of soothing or exhilarating the system as a whole, or of exercising a depressing or soporific effect, *e. g.* tobacco-smoke, or chloroform. In such cases, the smell and the common organic effect will fuse together in one consciousness.

Hence in man, smell also has a low place among the sources of knowledge. To many of the lower animals, on the contrary, it is a chief source of knowledge ; and some of them seem to think largely in terms of smell.

Touch and
its organ.

§ 47. III. *Touch* is the sense through which the self becomes aware of contact between its organism and solid things external to it. Hence it differs from the other special senses in not being restricted to a single point of the surface, but extending over the whole. And from its being a response to surface-contact with solid things, it is by its nature the most primitive and necessary of all the senses, and common to the lowest sensitive creatures.

Hence evolutionists have attempted to show that the other senses (with the exception perhaps of taste, the chemical sense), have been developed from touch, and are only more refined sensibilities to more delicate forms of contact. Thus, smell has been explained by contact with the molecules of certain vapours, and gases ; hearing, by contact with, and pressure of atmospheric vibrations ; vision, by the shock of etherial waves.

But tactual nerves, though not concentrated in one locality like those of other special senses, are not, like the organic nerves, wholly without any specially adapted end-organs. The skin is really a highly specialized organ ;

and (besides the other purposes which it serves) is specially adapted to the requirements of tactual sensation, and contains, embedded in it and protected by it, certain special end-organs of touch.

For under the epidermis, or outer protective layer of the skin, there are small conical papillæ in clusters or rows—most thickly crowded on the most sensitive parts, as on the fingers and palms, where they are arranged in rows, making the overlying epidermis rise in ridges. Some of them contain only blood-capillaries folded in loops, and nerve-endings without any special end-organs. But in the most sensitive parts, many of them contain an egg-shaped body, composed of one or more nucleated cells, into which one or several nerve-fibres enter. These are called *touch-corpuscles*. Other fibres, again, end in *bulb-like* swellings, different in structure from the corpuscles. The sensation arises from the epidermis being pressed down so as to compress the papillæ, and affect the nerve-endings contained in them.

Now it has been supposed that the nerves without any special end-organs are the organic nerves by which we feel the pain of cuts, and injuries of the skin; and that the *corpuscles*, (or the *bulbs*, or both), are the organs specially adapted to produce the special sensation of touch. Some, however, have thought that the *bulbs* are organs of temperature.

As touch is the source of important elements of knowledge, its *characteristics* require closer consideration.

(a) *Touch proper*, i. e. the passive affection occasioned by contact and pressure (as opposed to *active touch*, which is properly *muscular feeling of effort* combined with touch-sensation) is moderately sensitive to differences of *quantity* or *degrees* of pressure. The hand resting on a table (and therefore without muscular effort) distinguishes increments of $\frac{1}{3}$ in the weight laid upon it. Thus if the weight be 9 oz. it requires to be raised to 12 oz. (i. e. multiplied by $1\frac{1}{3}$) to produce a distinguishable difference of sensation. Other parts again are less sensitive.

(b) It is specially sensitive, however, to differences of *extensive magnitude*, as might be expected from its

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Touch papillæ and corpuscles.

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organ being extended. In other words, it distinguishes clearly between points pressing against the skin, as giving *acute* sensations, and larger objects, as giving *extensive* ones ; and between surfaces of different magnitudes, *e. g.* between a smaller coin and a larger one when pressed on the surface.

Their "local characters."

(*c*) As to its discrimination of *quality*, the qualitatively different feelings of *hard* and *soft*, *rough* and *smooth*, have sometimes been brought under the head of touch, but they have as much of muscular feeling in them as of touch proper. In fact, quality in tactual sensation seems to take the peculiar form of *local character*, or difference of sensation due, not to any difference of quality in the stimuli, but to the parts of the surface to which the stimuli (otherwise identical) are applied.

Thus, when stimuli of the same kind (*e. g.* the points of compasses) are applied with the same degree of force to different parts of the skin, we find the sensations themselves to be so far different in *quality* that we can not only distinguish them from each other as sensations, but can distinguish the parts affected, and learn afterwards to *localize* them in these parts.

Such qualitative differences, therefore, are not due to any difference in the stimuli, but only to the locality in which the stimuli are applied ; and the reason why different localities give specifically different sensations must consist in some specific *difference of the tactual nerves or end-organs* of these localities.

Local discriminativeness of the skin.

Different parts of the surface, however, differ greatly in their discriminative sensibility to points. The tongue is the most sensitive part, and can distinguish points not more than $\frac{1}{4}$ th of an inch apart. The finger tips come next, discriminating points $\frac{1}{8}$ th inch apart. But on the back, points must be $1\frac{1}{2}$ inch apart, to be distinguished from each other. We must suppose, therefore, that in such parts as the back, the nerve-endings must either be few in number or less *specialized*, so that their sensations are less distinguishable.

The contributions of touch to knowledge, however, depend largely on its conjunction with muscular feelings

of movement and resistance (in what some call *active touch*). But the purely *passive* sensibility supplies at least one fundamental and essential element of knowledge, *viz.* by means of its discrimination of *local characters*. By means of this, it gives an understanding of a plurality of points existing simultaneously and yet distinct from each other, and thereby the idea of *co-existence*. This understanding of distinct but co-existing points (when supplemented by the muscular experience of movement between co-existent points), enables us to arrive at an understanding of the *extension of things in space*, which is a fundamental constituent of our understanding of the external world.

The sensibility to *temperature* again has analogies both with organic feeling and with touch. It seems to be felt more or less in all parts of the organism (like organic feeling), but attains its clearest and distinctest form in the skin (like touch), and in those parts where touch is most distinct. But it is now believed to have a special set of nerves peculiar to itself (like a special sense, though they are most thickly distributed in the skin. But attempts to distinguish the nerves of temperature, and to find a special end-organ for them, in the skin, or elsewhere, have not been successful.

§ 47. IV. *Hearing*, though involving a more complicate and delicate mechanism than the preceding senses, is better understood.

The outer passage of the ear terminates with an elastic membrane called the *tympanic* or drum-membrane. Behind the drum membrane there is an air-cavity in the skull-bone—the hollow of the *tympanum* or drum—communicating with the nostrils by a passage called the *Eustachian tube*. Across this cavity from the back of the drum-membrane on the outer side, to another membrane in the bone on the inner side, stretches a chain of three small bones—

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The chain of bones.

(1) The *hammer-bone*, attached by one end to the back of the drum-membrane, and by the other end, to the *anvil*;

(2) The *anvil-bone*, with two feet (so to speak),—one resting upon the skull-bone on the other side of the passage, and serving as fulcrum, and the other pressing upon the stirrup; and

(3) The *stirrup-bone*, attached by its outer end to the anvil, but with its inner stirrup-like end pressing upon a membrane covering an aperture in the skull-bone, on the inner side of the air passage.

The cochlea.

Behind this inner membrane is a winding shell-like cavity in the skull-bone, called the *cochlea* (cockle shell) from its shape. The shell has three hollow ring-like passages on its top, called the *semi-circular canals*. These cavities are lined with membrane, and filled with a thickish liquid called the ear-lymph. In the lining membrane of the canals there are *nerve-cells* embedded, with hair-like projections of their protoplasm (called *cilia*) stretching into the lymph. The winding tube of the cochlea is divided for the greater part of its length into two passages, by a longitudinal partition formed partly of a plate of bone and partly of an elastic membrane, called the *basilar membrane*. Resting on this membrane there are parallel rows of string-like, ciliated nerve-cells, some 20,000 in number, attached at one end to the membrane, and supported at the other end by a double row of stiff rods, which rise obliquely from the same membrane. (These rows of cells and supporting rods form the *organ of Corti*, which has been compared to a musical instrument with wires or strings). And besides these there are small granules like grains of sand (called *otoliths* or ears-stones) lying loose in the lymph. The nerve-cells give out nerve-fibres which unite and form the *auditory nerve*, which passes through the skull-bone to the brain.

The cells of Corti.

Now, waves of atmosphere, flowing up the outer ear strike against the drum-membrane, and set it vibrating. Its vibrations pull and press upon the chain of bones; and the innermost one (the stirrup) pulls and presses on the covering membrane of the cochlea or shell on the inner side of the air-cavity, and sends vibrations or waves of liquid pulsating through the canals, and down one passage of the winding shell, and up the other—brushing against the ciliated cells of the canals and the organ of Corti, and apparently rolling the *otoliths* along the passages. And our different sensations of sound arise from the different ways in which the cells are thus affected by these agencies.

§ 48. The *characteristics of sound*, therefore, will correspond to those of the atmospheric vibrations which give rise to it.

(a) The *intensity*, or loudness of sound will depend on the force with which the waves of atmosphere are propelled against the drum-membrane, and thereby on the force of vibration of the body which communicates the wave-motion to the atmosphere. The ear can thus distinguish increments of $\frac{1}{4}$ th of the impelling force.

(b) The *volume* or *mass* of sound will depend on the area, or rather the number, of the sounding objects. Thus, the waves of the sea, the far extending reverberations of thunder, the many instruments in a band of musicians, produce the effect of volume, as contrasted with the diminutive impressions made by the ticking of a clock, or chirping of a bird.

(c) But the most interesting of the characteristics of sound come under the head of *quality*. This characteristic will include *pitch*, *timbre*, and *harmony*, which are most conspicuous in *musical* sounds, but enter into *noises* also :—.

(1) Differences of *pitch* or *tone* (place in the musical scale) are proved by experiment to depend on the rapidity of the successive waves, and therefore of the vibrations which cause them. When the number is under

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20 per second, they do not produce a continuous musical sound, but a series of beats or shocks (noises). But when the vibrations rise above 20 per second, their effects begin to run together in consciousness into one continuous sound. It is at first low in pitch, and harsh and grating to the ear. But as the rate of vibration increases in geometrical progression, the pitch rises in arithmetical, and becomes first the *bass* sound as used in music; and then at 2000 or 3000 vibrations per second, it rises into a high *treble*; and beyond 4000, becomes too high, sharp, and harsh for musical purposes. Beyond this, however, the rate of vibration may still be increased, until at about 40,000 it ceases to affect ordinary ears, and passes out of the range of sound-sensation altogether.

Individuals will, of course, differ greatly in their power of discriminating changes of pitch. Musicians must be specially endowed with this kind of sensibility, and in this consists what is called "ear for music."

Timbre.

(2)* But differences of pitch do not exhaust the differences of quality. Voices and instruments sounding the same pitch may, nevertheless, be qualitatively different. This additional difference of quality which is found in sounds of the same pitch, is called *timbre*. It has now been proved to be produced by secondary waves of vibration combining with every fundamental wave. Thus, when a string is set vibrating, not only does it vibrate *as a whole*, with one curve from end to end (making the fundamental wave), but at the same time smaller vibrations are running along the main one, making the wave to be a compound, including the fundamental wave and many subordinate ones. Hence, while the fundamental wave tends to produce one *fundamental* or *ground tone*, the secondary waves included in it tend to produce *over-tones*; and the mingling of different overtones with ground tones produces the differences called timbre.

(3) *Harmony* and *discord*, again, are qualities

brought out by two or more tones of different pitch and timbre, sounding together or in close succession. They may be so consistent with each other, that the conjunction of the two in consciousness produces an agreeable, soothing or exhilarating effect (harmony); or they may be so inconsistent with each other, that the attempt to combine them in consciousness produces a painful feeling of straining, tension, and effort (discord), which soon produces weariness and fatigue.

This effect may arise partly out of the physical processes of nerve and brain. These may be such as to help and further each other reciprocally, and result thereby in a harmonious compound process; or they may be such as to hinder and obstruct each other, and result in a conflict of forces, and "wear and tear" of tissues.

The difference between *musical sound* and *noises* seems to consist mainly in this—that in the former, the vibrations *run on continuously*, flow into each other, and *rise and fall gradually*, making it easier for organs and mind to follow them; whereas in the latter, the vibrations are little more than a succession of *unconnected beats and shocks, beginning and ending abruptly*, and therefore more fatiguing to follow.

But the very abruptness and brevity which makes noises to be more fatiguing to the ear, makes them to be more useful for *representative* and intellectual purposes, because it makes them more *distinct*. Hence noises serve the purpose of intellect, while musical sound appeals more to feeling. The sounds of nature are mostly noises, while musical sounds are mainly the production of man for emotional effect.

And hence nature has selected noises as the easiest and most effective way of representing ideas, and has provided men with an elaborate mechanism for the production of noises, *viz.* the *organs of speech*. Singing is an attempt to transform the noises of speech into musical sound, and therefore appeals more to emotion than to intellect. The distinction between different voices seems to depend mainly on their timbre.

§ 49. V. *Sight* is by far the most delicate and refined of human sensibilities, in respect of both quantitative and qualitative discrimination. Seeing, like hearing,

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is occasioned by *wave-motion*, but there is this vast difference in respect of delicacy : *hearing* ceases at about 40,000 vibrations per second, while *sight* only begins (it has been estimated) at 456 billions per second (in red light), and continues sensitive up to 667 billions (in violet light). For the vast interval between the highest limit of hearing and the lowest limit of seeing, and for the region above the highest limit of sight, man has no sensibility, though other beings may have. Hence beings may be conceived to exist capable of feeling and producing waves of force of intermediate and higher rates, without being manifest to human senses. The so-called X-rays and chemical rays seem to belong to the ultra-violet region.

But vibrations of such minuteness and rapidity cannot be conveyed by such a heavy substance as atmosphere. They imply the existence of a luminiferous *ether*, pervading interstellar space, and all but perfectly elastic.

Two kinds of
ocular sensibility.

Yet it must be borne in mind that there are two kinds of sensibility combined in the eye, both of them of the utmost importance intellectually, *viz.* (A) the *optical sensibility* to light and colour, which is peculiar to the eye, and (B) *muscular sensibility to movement and resistance*, which, though not limited to the eye, yet attains in it its greatest delicacy.

(A) Now as to the *special organs of the two sensibilities* thus combined in the eye :—

Optical sensibility and its organ.

1. The *special organ of the optical sensibility* to light and colour is the retina, or layer of protoplasmic materials spread out upon the back part of the interior of the eye-ball, in such a way that the lens can focus upon it the waves of the luminiferous ether.

The *retina* (net-work) is formed by the out-spread fibres of the optic nerve (which enters the eye-ball from behind), and their delicate end-organs ; and consists of a layer not more than $\frac{1}{60}$ th of an inch thick, and yet extremely complicate, including several thinner layers —

(1) Innermost (*i. e.* nearest to the centre of the eye-ball, and therefore to the lens and the light) is the net work of the fibres themselves, spreading out from the optic nerve ;

(2) Behind these is a layer of *branching, nucleated cells*, like the ganglionic cells of the brain, into which the optic fibres enter ;

(3) Behind the branching cells again, are several layers of small *roundish nucleated cells*, through which fibres from the outer layer pass backwards ;

(4) Behind these is a layer of symmetrically shaped *rods and cones* laid horizontally—themselves modified cells—in which the optic fibres finally terminate (after passing backwards through the other layers) ; and—

(5) Finally, behind these is a layer of *black pigment granules*, called the *choroid coat*, the object of which is, apparently, to absorb the superfluous light which passes through the other layers.

Now the ethereal vibrations, concentrated on the retina by the lens, pass through the transparent inner layers, and produce some effect in the *rods and cones* (probably), which is communicated through the granular layers to the ganglionic cells ; and these appear to generate the force which flows along the optic fibre to the brain, and is followed by sensations of light and colour.

Mode of operation.

It is probable, therefore, that the rods and cones are the end-organs specially adapted to give rise to optical sensation. That the optic nerves are not themselves directly sensitive to light, is proved by the fact that the point where the optic nerve enters and passes through the retina before spreading out on its inner surface, and where the other elements therefore are wanting, is a *blind spot* ; while the most sensitive part is a *hollow yellow spot* in the centre of the retina (called the *fovea centralis*, or central pit), where the other layers thin away, leaving the layers of rods and cones more directly exposed to the light.

2. The *muscular sensibility* of the eye, again, has its seat in the *muscular apparatus*, needed to move and adjust the eye to objects at different distances. Thus—

Muscular sensibility and its organ.

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(1) *Inside the eye-ball* there is the *ciliary* process and muscles, which form a belt about the lens, and by contraction and expansion increase and lessen the convexity of the lens, and thereby enable it to focus light from different distances on the retina.

(2) *Out-side the eye-ball* are six strips of muscle, each attached to the skull-bone at one end, and at the others, to the exterior of the eye-ball; and adapted to roll the ball in its orbit, so as to enable the lens to receive light from different directions. These include (1) four muscles called *recti* or *straight*, attached to the ball above and below, on the right and on the left, and adapted to turn the eye *straight* upwards and downwards, inwards and outwards; and (2) two called *obliqui*, for rolling it in oblique directions.

The ocular muscles are abundantly supplied with both *motor* and *sensory* nerves, and are in fact the most *sensitive* muscles in the body to degrees of movement and direction; and their muscular sensibility will be found to be the source of important elements of knowledge.

Optical sensations.

§ 50. (B) Next as to *the sensations of the eye*.—The purely *optical sensibility* of the eye, *i.e.* the sensibility of the *retina* and *optic nerve*, gives *light* with its different degrees of *intensity* (constituting *light* and *shade*), and its different *modes* or *qualities* (constituting the *colours*.)

Light.

For it is found that light like sound, is produced by wave-motion; and that its waves are not simple but compound, each fundamental wave including many smaller but much more rapid ones within it; and that it is the series of entire compound waves, striking against the retina in succession, that give the sensation of *white* or pure light.

Colour.

But it is found also that the compound wave can be broken up, and its constituent waves, (being of different lengths and rates of vibration,) can be separated and turned in different directions (as is done by

passing them through a prism); and that, when each is taken as nearly as possible by itself, it gives what appears to be a *simple* colour; but that, when they are combined in different ways, they give many different *compound* or *derivative* colours; and that objects have the property of absorbing some of the colour-waves (turning their force into the form of heat or chemical action), and of casting off or reflecting the rest, so that the reflected waves determine the colour of the object to consciousness.

And not only does the conjunction of them all in one compound wave give the sensation of *white*, but it is found also that the combination of certain pairs produces the same effect. Thus if the ten colours, red, orange, yellow, yellow-green, blue, indigo, violet, and purple, be arranged round the circumference of a circle, every pair of opposites will be found, when combined, to produce the sensation of white light. Such pairs are therefore said to be *complementary*.

Now these facts enable us to understand the different *characteristics* of optical sensation :—

(1) *Intensity* of visual sensation will be due to the closeness and force with which the luminiferous vibrations are propelled outwards from the luminous object. The greater the number in a given time, the stronger, brighter, and clearer will the light be. In the case of white light, different degrees of intensity will constitute the different degrees of light and dark, from the brightness of the sun down to the absence of all light-vibration, which constitutes darkness.

Intensity.

(2) *Quality*, or difference of colour, will arise from the disruption of the compound wave of white light into its constituent waves, and the reception of these into the eye either singly or in various combinations. Of the simple waves, red, it is known, has the widest and slowest wave, being close to the lower threshold of sensibility (about 450 billions per second);

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while violet is at the other end of the scale, having the smallest and most rapid wave, and standing at the highest limit of optical sensibility (about 700 billions.)

Waves smaller and more rapid than these do not affect the eye, but manifest themselves otherwise *e. g.* by producing chemical changes, and are known as chemical rays, X-rays, etc.

But there is such a thing as *colour-blindness* or insensibility to colour. It is most frequently insensibility to red, less frequently, to green, sometimes to yellow and blue, and occasionally to all the colours, leaving only light and shade. To such persons, the world appears like a picture in black and white.

Extensivity.

(3) * As to *extensivity*—the discrimination of the space-attributes of things involves the muscular sensibility of the eye, in conjunction with the optical. It is its muscle-feelings of strain and movement that give the number, surface-magnitude, form and position of coloured things. And hence it co-operates with touch and muscular feeling in contributing to the idea of space and extended things in space.

Hence the delicacy of its discrimination of *number* and *extent*, *form* and *direction*, combined with that of colour, makes the eye to be the most *presentative* and *intellectual* of the senses, *i. e.* the one which *presents* to the mind the greatest number of differences and relations of external things, so that we think and represent the world to ourselves largely in terms of vision.

C. The Muscle-Feelings.

Muscle-sensation.

§ 51. Finally, the *Muscular Consciousness* is of much importance psychologically, as supplying (in conjunction with touch and vision) the most fundamental and essential elements in our idea of the external world, *viz.* our understanding of the impenetrability, extension, and position of things in space. As a principal source of materials of knowledge, therefore, it may be treated along with the special senses.

By *muscular consciousness*, or *muscle-feeling*, we mean the distinct form of consciousness which we experience, when by a voluntary effort we move our limbs, lift a weight, or push a resisting object, and which we learn to localize (partly at least) in the muscles with which we perform the work.

The muscles themselves are the strips or bands of flesh, which assume at each end the form of ligaments and attach themselves thereby to bones; and by their contractions (when stimulated by out-going currents of nerve-force) pull inwards the bones to which they are attached, and thereby produce movements. Thus in the case of the limbs, they are attached to the bones above and below the joints; in the case of the eye, each of its six external muscles is attached at one end to the skull-bone, and at the other to the eye-ball.

These bands of flesh are found, on microscopic examination, to be composed of bundles of *fibres* (each fibre being about $\frac{1}{800}$ th of an inch in diameter); and the fibres are found to be bundles of still smaller *fibrils*. In the case of those muscles which are under the command of the will (called *voluntary* muscles), the fibres are distinguished by transverse lines, called *striæ*, (as if they were composed of discs joined end to end, like a row of coins joined together by their flat sides). This gives voluntary muscles a peculiar striated, or cross-striped appearance.

The fibres are developed from rows of protoplasmic cells which lengthen out cylindrically, and assume at last the segmentation into discs or cross-sections, which gives them their striped appearance.

Now the motor nerve-fibres terminate in, or among these muscle-fibres, and the out-going currents of nerve-force (flowing outwards at command of will, and giving *active muscle feeling*) flow into the protoplasmic contents of the discs; and cause in some way that shrinking of their contents which shortens the discs, and thereby the fibres and bundles as wholes, and thus moves the limb or organ. When the motor stimulus ceases, the fibres return automatically to their normal length. The repeated contraction of the fibres involves an expenditure of force, and the force is evolved by consumption (apparently oxidation) of the materials of the discs, which

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have constantly to be renewed from the contents of the blood.

And besides the ends of motor nerves, the bundles contain also *sensory nerve-endings*, so that their contractions and expansions, freshness and fatigue, are reported to mind by inward currents (and felt as *passive muscle-feeling*). Thus *while outward currents are producing movements, inward ones are producing sensation*.

Analysis of
muscle-consciousness.

§ 52. Now this muscle-consciousness, though it appears to be simple, is really complex, and appears to include *two constituents of opposite character and origin, viz. passive and active muscle-feelings*. Thus it contains—

Passive
muscle-feeling or sensation.

(a) An element of *passive consciousness, or sensation proper*—for every movement and muscular exertion involve a change in the state of the fibres of the muscles concerned (*viz.* from their alternate contraction and relaxation), a friction of the joints, an evolution of heat in the limb, tension and compression of the skin, increased circulation, exhilaration or fatigue, etc; and these changes in the limb affect the ends of incarrying nerves contained in the limb, and thereby make themselves felt in consciousness by ingoing currents.

The consciousness thus produced, therefore, will be of the nature of *passive affection* or *sensation* properly so-called, and akin to organic sensation. But this is not the only, nor the most important element in the muscular consciousness, for it contains also—

Active muscle
feeling, or
consciousness of
energy.

(b) An element of what may be called *active consciousness*; for when we move a limb, lift a weight, or resist a force, we are conscious of *effort, strain, or expended energy*, to overcome the weight and inertia of the limbs, and the resistance of external things. And this consciousness appears to be a consciousness, not wholly of the above *effects* produced by effort in the changed conditions of the muscles and joints, as reported by incoming currents, but of the actual *reaction and putting forth of energy by the self*—and therefore connected with *inner-*

vation, or the evolving and discharging of force along out-carrying nerves.

This kind of consciousness, therefore, will be the opposite of sensation. For sensation is a *passive* consciousness, in the sense that it rises from incoming currents affecting the thinking self; and is a consciousness of *being affected*, or *acted on*. This, on the contrary, will be a consciousness connected with the getting up and discharging of force by the *out-carrying nerves*, and therefore of *acting*, instead of *being acted on*; and, in this sense, an *active*, instead of a *passive* consciousness.

Yet, as the two currents are always nearly simultaneous, and in the case of continuous action wholly so, (the outgoing currents keeping up the activity, and the incoming ones reporting the result), they become fused together more or less in one compound consciousness, which may be called the *muscle-consciousness*, or *muscle-feeling*. Still the distinction between *acting* and *being acted on* is the most obvious and important within the sphere of consciousness, as being the basis of the distinction between *self* and *not-self*.

(c) Along with the properly muscular elements again, active and passive, there are usually tactual sensations also, of contract, friction and pressure, as when the movement of the limbs is resisted by external things. These serve the important purpose of *guiding the movements*, and become mixed up with the muscle-feeling. Hence the term *active touch* is sometimes used to denote the compound of muscular and tactual consciousness.

But an important *controversy* has arisen regarding the *muscular consciousness*. Some psychologists who prefer what may be called a sensationist view of mind, and regard consciousness as a wholly *passive* awareness of *affections* or states produced from without, have attempted to make the *muscular consciousness* consistent with their theory by explaining it as *wholly passive*. According to this theory, then, there would be *no consciousness corresponding* to the mental reaction, and to the *evolution and discharge of force by out-carrying nerves*. That would go

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Fusion of
the two.

Tactual sen-
sation—active
touch.

The con-
sciousness of
energy de-
nied.

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on automatically and unconsciously. What we call a consciousness of effort, innervation and expanded energy, would not really be such, but only a consciousness produced by incoming currents, reporting the changed states of muscles and joints resulting from the outgoing currents. The muscular consciousness would be *passive sensation, and nothing more*.

Thus when I walk, or write, or speak, the activities are really performed automatically and unconsciously. What I am really conscious of (apart from the state of desire preceding) is the effects or changes following the activities, *viz.* the changes produced by these activities in the limbs and external things, as reported by sensory nerves.

The outgoing forces themselves, therefore, would be known only *indirectly, viz.* through the effects which they produce; or in other words, only as *reflected back* again from the organs to the brain. And thus our consciousness would always be a consciousness of being *acted on*, and never of *acting*.

Criticism.

The objections to this hypothesis (which some think they can prove experimentally, though others think that they are misinterpreting their experiments) are:—

(1) That it seems contrary to the evidence of consciousness itself. For we seem to be clearly conscious of *putting forth energy*, and of *acting* as well as of *being acted on*; and regard the opposition between these two things as the widest opposition within the sphere of consciousness. The new theory would reduce this opposition to be an illusion.

(2) It involves a logical impossibility. There can be no action without reaction, and no consciousness of being acted on without consciousness of re-acting. All consciousness therefore must involve a consciousness of active effort.

(3) That it would render the very distinction between *self* and *not-self*, *mind* and *world*, inexplicable. We distinguish ourselves from the world by being conscious of ourselves as *acting*, and of the world as resisting, or *re-acting*. Now if there were no consciousness of the former, but only of the latter, the opposition between self and not-self could never have arisen. Indeed, without such opposition and contrast, it is difficult to see how consciousness itself would be possible.

§ 53. Now the different muscular experiences will be distinguished, like the different sensations proper, by differences of *quantity*, and of *quality*. And—

1. As to the *quantity* of the muscular consciousness with its *active* and *passive* elements,—~~the quantity of the active element will consist in the amount of conscious effort, conation or will-power put forth to overcome the resistance.~~ This will determine the quantity of force evolved in the brain and discharged by outgoing nerves; and this, the, quantity evolved within the muscle-fibres themselves (by oxidation, it seems), and thereby the intensity of the force with which the muscles contract to move the limb, and overcome external obstacles.

And the degree of the changes thus produced within the limb will determine the force of the ingoing currents which report them, and thereby the quantity or degree of the *element of passive sensation* which enters into the muscular consciousness—the feelings of tension, heat, friction, fatigue, etc.

2. As to the *quality* or *kind* of muscular consciousness, specific differences of quality will arise mainly or wholly out of the *passive* or *sensuous* elements of the consciousness. For the exercise of effort in itself will be *qualitatively* the same in all cases; so that differences of quality will depend directly on the *effects* which, the effort produces, as reported by the incoming currents.

But these effects themselves, again, will depend on the presence, degree and duration of the efforts and the outgoing currents. Hence muscle-feelings in respect of quality may be divided into three classes according as effort is *absent*, or takes the form of *free movement*, or that of *impeded movement*. Hence there will be—

(a) *Muscle-feelings of position* without movement, *viz.* the passive feelings of the states of the muscles, skin and joints when a limb is allowed to *rest* in a

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Different muscular feelings.
Differences of quantity.

Differences of quality giving

Feelings of position.

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Of free
movement.

particular position without any active effort, either to remove it, or to keep it there.

Such feelings will at first be restful and agreeable, but, will gradually change into weariness, until at last effort is needed to keep the limb in the same position.

(b) Muscle-feelings of free unimpeded movement through space; in which the continuous exercise of a single muscle, or the alternating rhythm of the muscles of different sides of the body give different kinds of *passive* muscle-sensation; and these will *fuse with, and colour the active consciousness* of the efforts to keep the limbs in motion. And these compound muscle-feelings will differ in kind in according to—

(1) The different *directions* of the movement—because different directions employ different muscles, giving different shades of feeling, as in moving the hand up or down, tracing a square, circle, or ellipse;

(2) The different *ranges* of the movement, or distances traversed—an inch, a foot, a yard, a mile—will give feelings differing in duration and degree;

(3) And the different *velocities* of movements—for feelings of movement will differ in intensity of effort and rapidity of change according to the velocity of the movement. A moving limb may take the same time to traverse a yard, a foot, or an inch, but the kinds of consciousness given by these movements will be different.

Of resist-
ance.

(c) Muscle-feelings of impeded movement, resistance, or dead strain; as in lifting, pushing, pulling, resisting; these are of the utmost importance psychologically, as giving the ideas of impenetrability and solidity, weight and inertia, which are the fundamental elements in our conception of matter and the external world.

The chief element in this form of the muscular consciousness, however, will be the *active consciousness of effort* in its different degrees. But the effort will be *coloured* by the passive muscle-sensations arising from the tactual contact and the pressure accompanying it,—the continuous tension of the muscle-fibres (as

contrasted with the *alternate rhythm* of free movement), the evolution of heat, the fatigue of the limb, etc.

And the contrast between the muscle-feelings of *free movement*, and those of *impeded movement* or *resistance*, forms the basis of our distinction between empty space and filled space or matter; because our idea of matter is essentially an idea of what *resists* our movements, and that of empty space, an idea of what makes free movement in all directions possible.

It is to be remembered, however, that the muscular feelings of position, direction, range and velocity are not accompanied at first by any understanding of extension in space, nor, therefore, of the real meaning of position, distance, etc. The child has to learn the meaning of its muscular feelings, and to know that they are the mental equivalents and representatives of extra-mental relations of things; and the understanding of this is *perception*.

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Matter and
space.

XII. PERCEPTION.

§ 54. We have considered the sense-organs and their sensations, and have found that the meaning and use of sensation in the economy of mind is to supply the means and materials by which we obtain our knowledge of external things. The next question therefore is, *How do we come to know and understand things by means of our sensations?* It will evidently be by a process of *interpreting or understanding what sensations mean and imply*, though the process comes to be performed so rapidly and automatically, that we are not clearly aware of its nature. In fact, interpreting our sensations is like reading a book. The pages and letters of the book are at first only sensations of touch and vision, but we have learnt to interpret them almost automatically into a world of ideas and knowledge about things; and so it is with our sensations.

Now the intellectual process by which we interpret our sensations so as to know by means of them the exis-

The problem
of perception.

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tence of material things and their qualities and relations, is *perception* (*external*, as distinguished from the *internal* perception of self and its functions in self-consciousness).

Perception is a word loosely used for several intellectual processes.° (1) It is often used for cognizing and knowing the truth of propositions in all different ways, even for knowing *mediately* or by inference; (2) it is used for all kinds of *immediate* knowing, including that of self as well as that of external things and their qualities; (3) it is used for *recognizing* the things which we see, hear, taste or smell; and (4) it is used for discerning *immediately* the existence of external things and their qualities and relations.

General definition.

In psychology the word perception is commonly used in the last of these senses, viz, to mean *the intellectual process by which we come to know, or at least to conceive and believe in the existence of external things with their attributes and relations, by means of our sensations*. It supposes therefore, that we have sensations in our minds, and that by means of them we know at once the existence and attributes of things outside of our minds—every sensation in the mind corresponding to a thing and quality outside of our mind (though not necessarily outside of all mind).

The two sides of epistemology.

It is well to distinguish, however, at the outset two distinct problems involved in perception—*psychological and metaphysical*.

*(a) The *psychological problem* of perception starts from the fact of experience, that for every sensation in the mind, we form the idea of and belief in a corresponding reality outside of mind; and inquires merely, why and how this idea and belief have been formed.

*(b) The *metaphysical problem* of perception goes further, and inquires how far the idea and belief thus empirically acquired by the mind can be supposed to correspond to actual substantial reality existing external to and independent of our mind; or what the reality is in itself which gives rise to our idea and belief.

But the knowledge of external things even from an empirical point of view can be seen to involve two closely related questions—(1) how we know and believe *that*

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Two elements of perception—cognizing existence, and recognizing identity.

external things are, and (2) how we know them *to be what they are*. When we experience a sensation, such as a sound, a flash of light, or a smell, we not only know at once that there is an external thing in direct relation to our sensibilities and possessing the attribute of sound light or smell; but in most cases we also know *what, the thing is*, and can say "there is lightning," or "that is the time-gun," or "that is sweet-briar." Thus the knowing of the thing by means of the present sensation evidently includes both (1) a question of *cognition*, viz. how we know that there is a thing outside of us, and (2) a question of *recognition*, viz. how we know what thing it is, or what class of things it belongs to.

These two acts, the *cognizing*, and the *identifying*, *recognizing*, *classifying*, are combined in one *complex mental process*; but of the two it is evident that the former is the more primitive and fundamental, (viz. how we know that there *are* external things), and precedes the other genetically. Hence in the earlier accounts of perception such as those of Reid and Hamilton, it is the only question discussed. In some later accounts, however, it is ignored altogether, and the question of perception identified with the question: How do you recognize or identify the things presented to us? (omitting altogether the question: How do we know that there are things?) This would seem to be from an impression that the *existence* of things is a metaphysical question, which is not to be discussed, but, merely postulated in psychology. This is wrong however, because the fact that we have at least the idea and belief in external things, is itself a fact of mental experience; and it is the business of psychology to explain the origin and grounds of this idea and belief. But as the *cognition* is so uniformly accompanied by the *recognition*, the two may be regarded as forming factors of the same complex process, and both included under the *knowing of external things*, and therefore under *perception*.

Hence we may make the above definition more explicit and define perception as—the *intellectual process by which, from present sensations in our own mind, we know the existence of things, and of qualities and relations*

Hence fuller definition.

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of things, external to and independent of our minds, and know by the qualities and relations revealed in our sensations what things they are—thus both cognizing their existence, and recognizing or identifying them.

§ 55. Hence we may regard perception as involving (1) *cognition of existence*, and (2) *recognition of identity*, and consider the two elements separately. Hence first—

I. *Perception as cognition of the existence of external things and their attributes.*—The question here is: *How do we come to know that there are other things besides ourselves?* In the first place, we know it by means of our sensations. But our sensations are only states of our own minds. How then can we know from *them* the existence of things external to our own minds? It can only be by interpreting and understanding our sensations; and it is in this interpretation of sensations that external perception consists. We feel our sensations to be forced upon us from without, and are thereby forced to explain them to ourselves by *thinking of something other than ourselves as their ground or cause, and thinking our sensations as the manifestations or effects of that external ground*; and are thus led to believe in the existence of external things having the attributes or powers of occasioning our sensations.

Thus every perception supposes a sensation, and is the passing of thought from the sensation itself (as a merely mental state) to the existence of something other than our mind as its ground or cause. And in or through every sensation, we cognize both the external something, and a power, attribute or quality of that something corresponding to the sensation. But in having sensations, we hardly think at all of the sensations as such, but pass immediately to the things, and qualities and relations of things, which they reveal. (It is to be understood, however, that the full meaning of externality

Perception of things as existent.

By interpretation of sensations.

has to be gradually learnt along with that of space. What is present to mind at first is merely the *otherness* or *not-selfness* of the sensation.)

But how is it, then, *that sensations, more than other states of mind, thus reveal to us the existence and qualities of external things?* It is in this way.—(1) A sensation differs from other states of consciousness in this, that it forces itself into consciousness from outside, interrupting the stream of thought, and in spite of, or without co-operation of our will. Other mental states are more or less subject to our will; sensations come and go independently. We can, by willing it, change the course of our ideas, and the series of active muscle-feelings, but we cannot avoid, nor change the taste or smell, the sound, the flash of light, the cold or heat. These are *in our mind* indeed, but at the same time depend on conditions which are external to our minds.

(2) And from this it follows that there is no relation of dependence or causation between sensations such as there is between other mental products. *One idea raises another idea*—ideas give rise to emotions—these to desires and these to volitions. But one sensation cannot of itself cause another sensation. It is caused neither by mind itself nor by other sensations, but by an external cause, and thereby manifests to us the existence of its external cause.

Hence the contrast between sensations and other states of consciousness forces upon the understanding self the distinction and contrast between *its own activity*, manifested by itself in its own voluntary states, and an activity *which is not its own*, manifested in its sensations. And as it is conscious of *itself* as the subject and ground of the one, so it is compelled to think of something which is *not itself*, as ground of the other; and as it is aware of itself as a reality or substance, and of its voluntary activities and states as powers, functions, attributes of itself; so it is compelled to think of the not-self also as reality or substance, manifesting its powers and attributes to it by occasioning sensations in its.

It thinks, in fact in this way: As its own voluntary activities and states are to itself, so its sensations are to

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Why do sensations reveal external things?

Cognition of self and that of not-self compared.

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Perception
involves
objectifica-
tion of sensa-
tions.

something which is, not itself. And external perception consists properly in *supplying the fourth term of the proportion, viz.* the existence of the not-self as the substantial ground of which the sensations are manifestations. This then is equivalent to understanding the not-self as a world of reality existing independently of the thinking mind—as an *external world*. And as our sensations with their qualities, degrees and relations become more fully discriminated, so our conception of the external world with its constituent things qualities and relations, becomes fuller and more adequate by continuous discrimination and interpretation of sensations.

Thus, as ideas and feelings directly subject to the control of will are felt to belong to the self, or to be *subjective*; so sensations, being to a certain extent independent of the self, are regarded as in some way *objective*, or belonging to the external world. Hence perception is sometimes described as consisting in *objectifying and localizing sensations, i. e. thinking them as qualities, or as manifestations and marks of qualities, existing objectively in things, situated in particular places*. For this objectifying goes so far that in some cases we forget that our sensations are sensations, and think of them as actual qualities inherent in objective things, as pain in the finger, colour in the rainbow, greenness in the leaf, heat in the fire, light in the sun. This habit is corrected, partly at least, by reflection, and we come to understand them as really states of our own minds, and as merely manifesting (as effects) the qualities (powers) of the things which occasion them; and to think of them, not as themselves *objective qualities* of external substance, but as *mental effects* of its qualities.

Perception
involves the
idea of sub-
stance and
attribute.

It appears, then, that perception is an application to sensations of *the idea of substance and attribute* (which involves again that of cause and effect). We are *directly aware of self as a reality, or substance* manifesting itself in certain functions and attributes (for we could not get the idea of substance from any other quarter); and are compelled to think of a not-self which is also a reality, manifesting itself to us in or through the sensations which it occasions in us.

It is not to be supposed, however, that the idea of substance is already in the child's mind full grown,

before it begins to have sensations. On the contrary, it is only in perception, in the continuous interaction of self and not-self, of voluntary change from within and passive sensation from without, that the understanding of self as a permanent reality can become explicit. And the reality which mind finds in itself, it is obliged to ascribe to not-self also.

Connected with the question of substantiality is another which has been the subject of a long controversy. Is the knowledge of external things which we have in perception, *intuitional* or *inferential*? Is perception *intuition* or *inference*? (1) Some have said (*e. g.* Hamilton) that we are directly and intuitively *conscious* of external things and their attributes at the same time, and in the same sense, as we are conscious of our own reality and functions. This is especially evident, it is said, in muscle-experience. We cannot be conscious of self as acting (*e. g.* in pressing or lifting) without being conscious at the same moment, of an impenetrable, extended, resisting (*i. e.* material) not self as reacting. Both facts—the reality of self as mind and of not-self as matter—are given in one and the same process of perception. This is the theory of *intuitive* or *immediate* perception.

(2) Others think that the reality of self, and that of not-self are not on the same level. The perception of the reality of self must be more fundamental than that of not-self, and logically antecedent to it. External things are not present in consciousness as the self is, but only *implied* in it. The soul, as Leibnitz says, "has no windows" through which external things can enter into it. "That which is felt is in the sensitive subject, and that which is thought is in the thinker." Consciousness is an inner circle; the world of things is an outer circle; the self can know the outer only indirectly through the medium of the inner. Thus we are first conscious of self as a permanent reality, and are then able to think of not-self as a reality also by analogy, and not without an element of inference. This is the theory of *indirect* or *mediate* perception.

The truth seems to be that, in being conscious of our own activity, we are directly aware of a foreign energy also which is not our own, and that the consciousness of our own activity would be impossible without this contrast. But though directly aware of this external energy, we are not conscious of it in the same sense as we are of our own energy—we are aware of it only as the *negative*

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Does perception give immediate or mediate knowledge?

Theories of intuitive,

And mediate perception.

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Origin of an-
thropomor-
phism.

*representation of Being
arising from man
+ all his kin*

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lation.

or outside of our own—it is not a *positive* consciousness. And still less are we *positively* conscious of the external ground of that energy as a permanent reality, in the same sense as we are of ourselves. If by substance we mean *what remains permanently the same through successive activities and changes of state*, then we can be intuitively conscious only of self as such; and must extend the idea to other things by analogy.

This conclusion that the external world is understood at first as a reduplication of the self, and according to the analogy of the self, explains the tendency of children and primitive people to personify external things. The child has a tendency to ascribe feeling like its own to external things, especially to moving ones. It learns gradually the difference between persons and things, and limits feeling and thought to the former, but leaves substantial existence to the latter. The personifying tendency survives to some extent however in many of the superstitions of primitive people.

Thus, in fine, we can see that the idea of an external world and the belief in its existence arise in the mind in consequence of its unavoidable attempt to account for and explain to itself its own sensations. For as soon as the thinking ego begins to be vaguely conscious of itself and its own activities, it necessarily begins to feel that its sensations are in some way independent of itself,—that it does not depend upon itself whether it shall have them or not, but that they are forced upon it, and withdrawn again in spite of itself, and that it is unable to alter their character, or carry them about with it (so to speak) in the same way as other feelings. The thinking principle with its awakening intelligence feels the necessity of explaining this irruption of impressions into its consciousness, and finds that it can do so only by applying the notion of thing, reality, or substance, and thinking of a thing distinct from, and therefore external to itself as the ground of these sensations. It is the necessity of an explanation, the consistency of this explanation with the conditions of intelligence, and the inability to find any other explanation that would

be so, that press on the intelligent self the idea and conviction of a world of things external to self.

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Every sensation, therefore, which is clearly apprehended as a sensation (*i.e.* as a state of consciousness forcing itself into the series of conscious states without the conscious co-operation, so to speak, of self), necessarily entails an act of perception. And this is essentially nothing more than the *self's cognition of the element of not-selfness* contained in such a state of self, *viz.* the element of compulsion or constraint,—carrying with it the idea and conviction of a something external to and independent of self as its sufficient ground (if we may use the word *ground* to cover both *substance* and *cause*, no distinction being made at first between these two ideas). It is clear, therefore, that the idea of *substance* must be supplied by the mind from its own *self-consciousness*. It cannot be conscious of extra-mental things as things, but only of the mental affections of which they are the ground, and can know them only as the objective ground or not-self implied in its sensations. We come next to—

§ 56. II. *Perception as the recognition of external things.*—We not only cognize the existence of things but we *recognize* what things they are. In mature life, at least, there is probably no cognition of existence without some recognition of what existence it is, *i. e.* some assimilation of the thing to other things perceived before, and thereby some recognition or classification of the thing perceived. When we hear a sound, we perceive not only that there is a sounding thing somewhere, but also that the sounding thing is a bell or a gun, *i. e.* we recognize it.

Perception of
the identity of
things.

How then is this element of perception accomplished? Every sensation, we have found, reveals a quality of a thing. But (after the very beginning of conscious life) sensations are never absolutely new. It may be said of almost every quality of a thing, and of most sets of qualities, that we have experienced it or them somewhere before, in previous acts of perception. Hence, when experienced again, they are felt to be the same as have been experienced before; and the thing is thereby recognized as thus far the same, or as of the same kind, as some

Recognition.

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thing or class of things experienced before—*viz.* as giving the same sensations, and therefore having the same qualities.. Thus, when I experience a particular colour, or sound, or smell, I am usually able to say not merely that that is a yellow thing, or a sounding thing, or a fragrant thing, but also that it is an orange, or the time-gun or a sweet-briar shrub—expressing the fact that I not only *cognize the existence* of the thing, but also *recognize what thing* it is. Hence my perception may be said to include both the *cognition* and the *recognition* of the things.

The process
involved—
automatic
revival by

What then is implied in this recognition of things, or how is it accomplished? It involves *retention and representation, i. e. memory*. The fact, that a present sensation and thing perceived can be recognized as identical with a previous one, implies that past experiences can be in some way retained and reproduced or represented in the present. And this again is explained by supposing that every experience makes some permanent impression on the system, and thereby leaves some *trace* of itself, which remains even after it has sunk out of consciousness. Thus when the *same* sensation or thing has been experienced several times in succession, its traces, being identical, amalgamate and strengthen each other (by assimilation), so as to be permanently impressed on the system. And further, when several *different* sensations are experienced together or in close succession so as to form one whole of experience, the traces which they leave are also connected together in the system (by association), so as to make one whole of thought. Hence when any one is roused into activity again, it rouses the others along with it. Thus when a sensation A occurs again, it strikes into the traces of its own former self, (*viz.* a_1, a_2 , etc.) and raises them into activity along with itself; and these again, by their revived activity, revive also the traces of other sensations that have been associated with it, (*viz.* b, c, d , etc.). In short A in *presentation* revives a, b, c, d , in *representation* (memory).

Assimilation.

And
association.

This helps us to understand what is meant by recognition in perception. Suppose that we experience present sensations of roundness and yellowness (A and B) giving the cognition of a round, yellow thing. Then these sensations strike into the traces of previous sensations of the same, *viz.* a and b , and revive them.

But these traces, in reviving, will revive also *c, d, e, f*—i.e. former sensations of touch, taste, smell, and perhaps the name (e.g. orange), with which they have been associated in the past.

Thus the *present* sensations which the thing gives us bring up in *representation* all the other sensations which it has given at different times, including its name; so that we now have our whole knowledge of the thing brought before our minds in presentation and representation together, *vis.* *A B c d e f*, and thereby know it to be an orange. In other words, we perceive both that there is some external object present as ground of our sensation (cognition), and that that something is of the kind called orange (recognition).

Still, this process of memory and recognition, though really so complicate, passes through the mind so rapidly and automatically that we are not clearly aware of performing it at all, and fancy that the whole concrete thing is directly present to our consciousness at once.

Thus when I hear a particular sound and say "that is the 1 o'clock gun," the complex perception includes (1) the *sensation*, and *simple cognition* that that is an external thing having the power to cause it, expressed by saying "that is a sounding something"; and (2) the *recognition* which would be fully expressed by saying "that sounding object is a metallic tube of peculiar shape and size, mounted on the parapet of the fort, two miles away, charged with gun-power, and fired off with the sound which I hear, at 1 o'clock every day, and called a gun." These facts however are brought before my mind only in *representation* or idea. But they combine in one whole of thought with the present sensation, and *the whole aggregate of presented and represented sensation gives the conviction that there is an external thing with qualities corresponding to these sensations.*

Thus the *percept*, or product, of perception, may be said to include (1) the presented element or present sensation which gives us the *cognition* of an existent thing; (2) the represented elements, *viz.* the other sensations which the thing has given and is capable of giving, represented in idea and which gives us the *recognition* of the thing; and (3) both these elements, *i. e.* both the *cognition* and the *recognition*, involve the notion and conviction that there is an external reality

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with attributes corresponding to these presented and represented sensations.

Knowledge of things, therefore, is mainly knowledge of their *attributes or qualities*, i. e. their inherent powers by which they manifest themselves to us in our sensations (which, though in our minds, are yet phenomena or manifestations of external things.)

Therefore the *qualities of external things* require further consideration.—

XIII. THE QUALITIES OF BODY.

Sensations manifest and represent qualities of objects.

§ 57. Perception reveals the existence of things having such and such qualities. A thing's qualities are its powers of producing effects upon other things; and, in the case of sensitive beings, the effects produced on them include sensations. *Every sensation therefore reveals the existence of an external thing having a certain quality which is manifested in the sensation.* And our direct knowledge of the qualities of external things is co-extensive with the range of our sensations, and the perceptions corresponding to them.

Thus our conception or knowledge of a thing is arrived at by putting together the results of many perceptions. Each perception gives a quality of the thing, and by associating these together in our minds, we form an adequate conception of the thing, as something existing independently of ourselves, and permanently manifesting these qualities, i. e. exercising these powers.

Object as unity of substance and qualities.

Thus in thinking an object of perception we think it as consisting of two correlative factors:—

(a) *As an aggregate of qualities or attributes*, which we think in terms of the sensation which they give us. Thus we think of the fruit as an aggregate of powers which affect our tactual and muscular sensibilities and those of colour, taste and smell, and which we represent to ourselves therefore in terms of these sensations (though we know that the qualities and the

sensations are not the same thing). But the qualities considered apart from anything to support and hold them together are only abstractions; therefore we have to think the thing also—

(h) *As an entity or substance*—something in which these powers or qualities inhere, and which gives them their connection, unity, and permanence, and which preserves and manifests its own existence by means of them; so that they are always present together, producing their effects on other things, and (along with their other effects) occasioning sensations in sensitive minds within their range.

Thus quality is nothing without substance, and substance nothing without quality. The two together constitute the concrete *reality* and *object of perception*. And the notion of substance as what gives permanent unity to a system of powers would appear to be derived from our consciousness of ourselves as the unity of thinking, feeling and willing. We are not directly conscious of such a permanent unity of powers anywhere else.

The psychology of perception has to explain therefore (1) *how we come to know and think of external things as realities or substances in this sense*, and (2) *how we come to know and represent the different qualities manifested by external thing*. We have considered the first question, and also the second in a general way. But there are certain primary and fundamental qualities on which our understanding of the external world depends so much that they require special consideration; and to prepare the way for the consideration of these, we have to make a classification of the qualities of matter into *primary* and *secondary*, fundamental and non-fundamental. After that, we shall have to inquire specially how an understanding of the fundamental ones is acquired by perceptions of the different senses.

(But we have here to consider these questions only from a psychological point of view; *i.e.* to consider not what things and qualities may be in themselves, apart from our sensations and representations, but only how we think and represent the things in our own minds.)

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CHAP. XIII.

The qualities
of objects.

PART. IV.
CHAP. XIII.

Distinction of
primary and
secondary
qualities.

§ 58. Hence in dealing with the qualities of external things we have first to consider *the distinction between primary and secondary qualities, and then to consider how our ideas of these qualities, especially the primary ones are acquired*

For some of the qualities which in perception we ascribe to things (as *attributes* of objective *substance*) have to be thought as universally present in the things, and as always essentially the same, and as constituting the *essence* of the things, (i.e. as such that in them the substance of the things *expresses* or *manifests* the *essential nature* which distinguishes it from other substances); so that without them the things either would not be things at all, or would be things of an entirely different kind. Others, again, may be thought as present or absent, and as undergoing change, and as different at different times; and are such that one may be substituted for another without altering the essential nature of the thing. The former class of qualities may be called *primary* or *essential*, because without them the thing would not be a thing in the same sense; while the latter may be called *secondary* or *non-essential*, because the thing may have them or be without them, and yet remain essentially the same in kind. Hence—

What makes
certain quali-
ties to be pri-
mary?

I. *As to primary qualities.*—We find by experience that the external things which are the grounds of our sensations manifest themselves to us always as *filling certain areas or extents of space*, i.e. as being *extended*, (giving the attribute of *extension*); and as *resisting motion through the portions of space occupied by them*, i.e. as *impenetrable*, (giving the attribute of *impenetrability*). And we find by invariable experience that, wherever there are objects capable of occasioning sensations in us, they manifest these attributes of *extension* and *impenetrability*.

Therefore we combine these attributes in our minds into one complex idea of *what is essential and common*

to all the external things which we think of as the ground of our sensations; and fix that idea in our minds by applying the term *materiality* to it, as being the idea of that which makes matter to be matter. And because they manifest themselves to us universally under this fundamental form of materiality (*i. e.* as occupying, and resisting motion through space), we speak of the things which occasion our sensations as *material*, and as constituting a *material world*.

In other words, we regard extension and impenetrability as the *primary qualities* of matter, or those which make matter to be matter, and without which it would not be matter.

Now the *extension* of things, with its different modes or aspects of *form*, *magnitude*, *distance*, *position* and the three *dimensions*, may be spoken of as the *geometrical* or *spatial* properties of things—their relations to space, and to each other in space. *Impenetrability*, again, with its various modes such as *inertia* and *hardness* (*i. e.* tendency to resist movement through, or change of position in space), and *weight* and *impulse* (*i. e.* tendency to move, and produce change of position in space) may be spoken of as the *dynamical* or *force-properties* of things—their properties of excluding each other in different ways and degrees, from particular parts and positions in space.

Still it must be borne in mind that even these primary qualities are known only by the ways in which they manifest themselves to us through our capacities of sensibility, and that we can represent them only in terms of our subjective affections, *i. e.* the sensations which they give rise to.

II. *As to secondary qualities*.—There are other qualities which are not essential to the existence of material things in the above sense, but may be present or absent, and may differ not only in different things, but in the same thing at different times. Thus one flower is red, and another blue; the leaf is at one time green, and at another time yellow; water is cold or hot, liquid or solid—though their fundamental qualities of

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CHAP. XIII.

Primary qualities are geometrical and dynamical.

What makes certain qualities to be secondary?

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Primary qualities may be understood in a realistic sense.

impenetrability and extension remain the same. These may therefore be called *secondary qualities* of things; and to this class belong the different colours, tastes, smells, sounds, and temperatures of things; because, though material things must have some colour, taste, temperature, etc., no one particular colour or temperature is essential to their existence as material things.

This distinction between *primary* and *secondary* qualities is commonly explained in this sense, that (1) the *primary*, are essential to the objective existence of material things as such, and *are* therefore actually *in the objective things* (considered as extra-mental things in themselves independent of our sensations and ideas), just as they *are in* our ideas of them; or in other words, that, in so far as *primary qualities* are concerned, the percepts and ideas of our minds are *exact copies of things outside of our minds*. But (2) the *secondary* qualities, such as colour, taste, smell, sound and temperature, are only *sensations* of our own minds, which we learn to *objectify* and *localise*, *i. e.* think of as qualities of objective things, by habit of imagination—(what is really objective and extra-mental, in their case, being only certain unknown properties inherent in the objective things, through which the things cause these sensations in us).

Thus the primary qualities are held to be the same both *subjectively* and *objectively* (*i. e.* as forms of idea, and as attributes of extra-mental things independent of idea). But the term *secondary quality* is used to cover two senses: (i) a *subjective* sense, *vis.* for the quality as it presents itself in our consciousness, *i. e.* the subjective affections of taste, colour, heat, etc. which imagination objectifies and thinks of as qualities of external things; and (ii) an *objective* sense, *vis.* for the real qualities or powers inherent in the external things, which have to be assumed as the grounds or causes of the subjective affections,—(and which will be some modification of primary qualities, as *e. g.* heat, light, and sound have their objective grounds in different modes of motion, or changes of position among the molecules of things).

But this view of primary qualities is (1) really a metaphysical one, assuming a knowledge of things as they are in themselves apart from our sensations; and further, (2) it is of doubtful validity. For it should be borne in mind that even the primary qualities are known

Or in an idealistic one

to us only from the way in which external things affect our sensibility, and that we can represent them only in terms of our own sensations. Hence it may be a mistake to assume that our ideas even of the primary qualities of matter can have any *resemblance of kind to the real objective qualities* of things. They may represent them only symbolically, somewhat as, *e. g.* articulate sounds, or written letters represent ideas of the mind, without having any resemblance to them. Mental products may represent, but cannot be identical in kind with extra-mental things.

§ 59. Hence the chief thing which the psychology of perception has to do (after explaining how we form our idea of, and belief in the existence of external things and qualities) will be to explain *how we arrive at our understanding of the different primary qualities of external things. To which of the senses, then, are we to look for an understanding of primary qualities?*

Though all the senses give perception, in the sense that every sensation reveals the existence of something external to self as its ground or cause (because every sensation supposes the action of a not-self upon the self), yet it is only *some sensations* that give a clear understanding of the primary qualities of the external substance, implied in sensation—*i. e.* of this not-self as *impenetrable* and *extended substance*, and therefore as a *material world*.

Now *impenetrability* and its different forms, *hardness, weight, impulse*, are dynamical qualities, thought by means of the idea of *force* or *energy*; and even the geometrical qualities, extension in space with its forms, magnitude, shape, position, suppose something impenetrable as occupying and situated in, or moving through space, and therefore suppose an understanding of the dynamical qualities at the same time. Therefore an understanding of the primary qualities of matter is really based upon the *idea of force*, or *energy*; and material substance has to be thought as *a reality which manifests itself by exercising energy in the different ways of moving through, and occupying and resisting movement through space*, (energy thus manifested being called *physical force*, to distinguish it from other possible forms of energy, such as that of thought). Whence *energy* may be regarded as the essence or fundamental quality of all substance or

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Which of the senses reveal the primary qualities and why?

The dynamical qualities, the most fundamental.

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reality alike (mental as well as material); while energy manifesting itself in "the occupation of, and change of position in space (*impenetrability* and *extension* in their different forms) must be regarded as the distinguishing characteristics of *material* substance.

It follows from this, then, that a clear understanding of external reality as *matter* (*i. e.* as substance manifesting the dynamical and geometrical properties of moving and resisting motion through *space*) can be arrived at only through those senses in which the passive sensation or affection (the *sensation* properly so called) is clearly combined with *dynamical consciousness*, or *consciousness of energy in the form of movement or resistance to movement*, *i. e.* of physical or muscular energy. In other words, it can be arrived at only by *those senses which involve muscular feeling of movement and resistance*.

Now we have found that *touch* and *vision* are both accompanied by muscular work, and muscle-feeling. These, therefore, will be the main channels of external perception. They alone will give the primary qualities of matter directly; the others will give only secondary ones. Thus leads us to consider—

XIV. THE PERCEPTIONS OF THE DIFFERENT SENSES.

§ 60. Having distinguished and classified the different attributes of the external world, we have next to consider how the understanding of these attributes is attained by *perceptions of the different senses*, and more especially how the primary and fundamental ones come to be understood. Now we shall find (1) that the primary ones are learnt mainly by the combination of muscle-feeling with touch, or what we may call *tactuo-muscular experience* (active touch), and shall therefore have to consider this class of experiences and their perceptions. And (2) we shall find that certain spatial (geometrical)

Questions requiring consideration.

primary attributes are given also by the muscle-sensations of the eye (*viz.* extension in two dimensions), and shall have to consider how this is. And (3) we shall have to show how the results of tactuo-muscular and visual perception are combined by association, so as to perfect our understanding of the primary qualities or essence of matter. And finally we have (4) to consider how secondary qualities are given by passive muscle-feeling and touch, by optical sensations of the eye, and by the other sensations, hearing, smell, taste, and organic sensibility.

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Tactuo-muscular Perception.

By this we mean perception arising from the use of the limbs, and therefore from muscular feelings combined with touch (wherever the limbs come into contact with resisting things). It will therefore include perceptions derived from (i) the muscle-feelings proper, including the *active* muscle-feeling of putting forth effort, or of expended energy by out-carrying nerves, and the *passive* muscle-feeling or sensation resulting from the changing states of muscle-fibres and joints caused by movement (and reported by in-carrying nerves); and (ii) the *passive* feelings or sensations of touch themselves, wherever there is contact. Now these combined experiences give the following results.—

Sources of
tactuo-muscular
perception. (§ 52).

§ 61. I. *The understanding of impenetrability and of impenetrable substance* may be explained in this way.—

Qualities of
matter given
by tactuo-
muscular per-
ception.

The exercise of muscular energy by outgoing nerves may be followed by either of two kinds of muscular consciousness—either the feeling of *unimpeded energy* (*free movement*), or the feeling of *impeded energy* or *resistance*.

Successive
movements
and resist-
ances give
impenetrabi-
lity of matter.

1. *In the case of resisted movement*—the active consciousness of effort. and the passive sensation resulting

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resistance.

from the tension of muscles and joints, are both *continuous and intense*, and are accompanied by *tactual sensation* of pressure, and by increase of circulation, and *evolution of heat* in the limbs, and are soon followed by organic feeling of fatigue and exhaustion; and all this, *without being followed by any change or relaxation*, either in the degree of effort, or in the tension of muscles and joints.

Feeling of
movement.

And these different experiences make up together what we call the feeling of *dead strain, impeded energy, or resistance*, as in pushing, repelling, or lifting.

2. *In the case of free movement*—the expenditure of effort may be little more than perceptible, the feeling of resistance and tactile pressure is absent or reduced to a minimum (*e. g.* the resistance of the atmosphere), and the passive sensation arising from the tension of the muscles and joints is less and different in kind, and undergoes continual variation from the alternate relaxation of one set of muscles and contraction of another, as in moving the hand backwards and forwards in empty space.

Synthesis of
the two.

In this case, then, we have the feeling of activity in the form of *free unimpeded movement*.

Now the above two kinds of experience are strongly opposed to each other, and give rise to two opposite ideas regarding the external not-self which makes these opposite experiences possible. In the former case, we are compelled to think of something external, having the attribute of *resisting our movement*, and giving us the above peculiar feeling of *being resisted*; in the latter case, of some external condition *making free movement possible*. Hence (1) the experience of impeded movement gives us the notion of *an external reality having the attribute of impenetrability, i. e.* of filling and resisting motion through space; while (2) the opposite experience of free movement helps us to an understanding of *empty space*, and change of position in space. And (3) by combining these ideas of *what resists movement* and *what makes free movement possible*, we arrive at the idea of *extended substance (matter)* and of *extension* in the abstract.

The different *modes* and *degrees* of impenetrability, such as *hardness*, *elasticity*, *fluidity*, and the like, do not present special difficulty. But it remains to be explained further how we get a full understanding of *space* itself, and of impenetrable things as *extended* in space. Hence—

§ 62. II. *The understanding of extension, as an attribute of impenetrable things, or of impenetrable things as extended in space.*—The next step is to consider how the idea of a *resisting* something comes to be elaborated at last into an idea of an *extended something*, occupying or *resisting* motion through a definite extent of space.

Now, in understanding a thing as *extended*, we understand it as composed of *an aggregate of resisting points or particles external to each other and to the thinking self, and yet existing simultaneously, and resisting motion through them, while admitting of motion along and round about them.* Hence, to get the idea of an *extended* thing, the idea of *resistance* has to be combined in a peculiar way with the ideas of *co-existence* of parts, and *motion* along and round them. For it is this simultaneous existence of its constituent parts that distinguishes an *extended* thing from a *succession* of events in time.

(a) The first question therefore is, how the understanding is acquired of distinct units as *co-existent*, or *existing simultaneously*.

Now movement along a series of resisting points (such as the edge of a table) gives these points only in succession to each other; so that these experiences of resistance are understood only as *events in time*, (whereas an *extended* thing must be understood as composed of *co-existent* resisting points). And it is evident that experiences of succession can never of themselves be made to yield an understanding of co-existence, which is the opposite of succession.

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Synthesis of movements and resistances gives extension of matter.

The idea of an extended thing involves resistance, co-existence and movement.

The notion of co-existence.

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Therefore this idea of co-existence can be derived, only from those senses which, (by their attribute of local discrimination) give several distinct units of sensation, *simultaneously, viz. touch and sight*. Thus the eye can distinguish several stars simultaneously as distinct points of light against the dark background of the sky, even without any movement of the eye-balls; and by the local discrimination of the skin we can distinguish several different points of contact experienced simultaneously; *e. g.* the points of compasses, or the finger tips of one hand pressed against the palm of the other.

Such distinct but simultaneous experiences, therefore, (contrasted with experiences of movement and succession), will give some preliminary understanding of co-existence. But this does not of itself amount to an idea of extension in space because *that idea includes also the idea of possible movement between and around co-existent resisting points*. Hence the idea of co-existence will have to be combined with that of movement, before we can attain to the idea of space and of extended things.

(Though some have thought that these experiences of touch and vision by giving distinct units of reality existing simultaneously, external to the self and to each other, already give or involve a rudimentary notion of space).

(b) The next step, therefore, is to combine the idea of *co-existence* with that of *movement*, into one complex idea of an object extended in, or occupying space.

Suppose, again, that a moving limb encounters a series of resisting points, *a, b, c, d*, (*e.g.* the finger, in moving along the edge of a table). These contacts, we have found, are only a series of events in time, and though they suggest external things, yet they do not, of themselves, give any understanding of the co-existence of the things, nor therefore of their extension in space.

But suppose that the movement is reversed, giving the same experiences of ~~distance~~ *distance*, but in the reverse

Synthesis of
co-existence
and move-
ment giving

order, *d, c, b, a*; and also that the movement forwards and backwards is repeated several time, giving always the same series, only in opposite orders-- *a, b, c, d, — d, c, b, a*. This repeated recurrence of the same units of resistance will impress the mind as requiring explanation; and prompt it to apply to these successively experienced points, its already acquired notion of co-existence; and to explain their recurrence by thinking of them as co-existent, and as *capable* of being experienced simultaneously, (if only the surface of the perceiving organ be large enough). Now this process of interpretation gives us an understanding of—

(i) *Linear extension*,—for an aggregate of resisting points experienced successively by means of muscular movement, but conceived as existing simultaneously, and capable of being perceived simultaneously (*e.g.* the edge of the table), constitutes what we understand by a *line*, and involves an understanding of *linear extension*, or extension in *one dimension*.

The line.

And the acquisition of this idea will probably be rendered easier by those cases in which the resisting points thus successively experienced, are on the surface of the body itself, as in drawing the finger of the right hand along the palm of the left. For in this case, there will be a consciousness not only of the moving hand, and *its* successive feelings of being resisted, but also of the resisting points themselves *a, b, c, d*, and *their* feelings of resistance. These latter will linger simultaneously in memory, and help out the idea of co-existence, and help us to combine it with the idea of movement.

And from the above we can see *how the different modes of linear extension* come to be understood:—

(1) The *length* of the line, or *magnitude in one dimension*, will be judged by the *quantity of muscular exertion* in the form of movement (*i.e.* the combined *degree* and *duration* of the effort) required to move the limbs along all the *units* composing the line, from

Length
of line.

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the one end to the other, *e.g.* a yard will require three times as much as a foot, and so on. Thus, we can distinguish very clearly between distances which can be walked in five minutes, an hour, and a day, by means of the consciousness of time and muscular expenditure required. These experiences together, then, constitute our measure of *real distance*, and therefore of *linear magnitude*.

Direction.

(2) The *direction of the line* will be distinguished by the different *qualities* or *kinds* of muscle-feeling experienced in following it. Different directions, upwards and downwards, right and left, inwards and outwards, *exercise different muscles*, giving different *kinds* of muscle-feeling by which these directions can be distinguished from each other.

Form.

(3) The *form of the line*, again, straight, curved, and so on, will be distinguished by the transition, gradual or abrupt, *from one direction to another, i. e.* from one kind of muscle-feeling to another. In the straight line, the muscle-feeling felt continues the same throughout; in curved lines there is a gradual, and in angular ones, an abrupt transition from one *kind* to another, marking different directions.

Position.

Thus the *kind* of muscle-feeling (depending, as it does, on the muscles exercised) is our criterion of direction and form, as its *quantity* is our measure of distance and magnitude. And the *position* of a point will be determined by the length and direction, taken together, of the line or lines connecting it with other points. Now a similar combination of ideas, only more complicate, leads us to the conception of—

Surface.

(ii) *Surface extension*.—We may suppose a plurality of *lines* of co-existent resisting points, extending upwards and downwards, right and left, and round about, and capable of being followed by the hand when stretched at full length; and may suppose that they have been experienced several times in reverse

orders, and found always to recur, as before. Then this plurality of lines, also, will have to be explained by our applying the idea of co-existence, and conceiving them as a co-existent aggregate of *lines* of resisting points at the same distance from us; and the result will be a conception of a resisting *surface* or *plane*, and of extension in *two dimensions*.

And the *magnitude* of the surface will be judged by the *duration* and the *degree* of energy in the form of movement needed to move over or round it. Hence the difference to us between a square foot, a square yard, and a square mile is ultimately only a quantitative difference of muscle-feeling combined with time.

Surface
extent.

The *form* of the surface, again, will be known by the successive *directions* (or different kinds of muscle-feeling) experienced in following the peripheral line—the triangle, square, circle, etc. all exercising different kinds of feeling, marking different directions. A further step in the same line of thought leads us to—

(iii) *Solid extension*—which supposes an understanding of the third dimension, *viz. depth* or *distance outwards*, and power of combining the three dimensions, which are by themselves abstractions, into the idea of a concrete *solid object i. e.* one occupying space and resisting movement from all directions.

Solidity.

Thus we can conceive depth or distance outwards by moving the hand outwards and inwards, thus conceiving a *line* running from ourselves outwards. By moving it both outwards and inwards, and upwards and downwards, we conceive a *perpendicular plane* stretching outwards; and by moving outwards and inwards, right and left, we conceive a *horizontal plane*. Then by combining perpendicular and horizontal planes we can conceive a solid body extended and occupying space in three dimensions.

Solids have many *forms*, and their forms are distinguished by the different directions of their peripheral lines and surfaces—globular, cubical, polyhedral—but

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	<p>they all agree in this, that they occupy a definite portion of space in such a way as to resist motion through it from every direction.</p> <p>And in proportion as the conception of solid bodies occupying portions of space becomes more explicit, so will the understanding of the <i>empty space</i> lying between bodies, and making unresisted movement between them possible. By empty space we understand <i>an unlimited number of co-existent points admitting of motion through and between them in all directions</i> (instead of resisting it as the extended thing, or filled space, does).</p>
Empty space.	
Distance.	<p>The <i>distance</i> between bodies in space will be measured by the <i>quantity</i> (<i>i. e.</i> <i>duration</i> and <i>degree</i> together) of muscular effort which has been experienced (or which would be experienced), in passing through empty space from one to another. Thus we can form no other conception of the distance of the moon or sun than by vaguely multiplying in our imagination our own past experiences of muscular movement.</p>
Position.	<p>The <i>position</i>, again, of a particular thing in space will be determined by the <i>length</i> and <i>direction</i> combined, of the movements (imaginary lines through space) experienced in passing between it and one, two, or more other things.</p>
Objective movements.	<p>And the <i>movements</i> or <i>changes of position</i> of extra-organic thing (<i>objective</i> movements, as distinguished from those of our own limbs) will be perceived in two ways—(1) by remaining motionless ourselves and allowing the impression of the things to pass across the retina or the skin, in which case its motion is known by the different local feelings of the different points of the surface successively affected by it; or (2) by following the moving object with the muscles of the hand or neck, so that we feel the movement of the object by means of our own muscle-feelings.</p>
The notion of space—is it <i>aposteriori</i> or <i>apriori</i> ?	<p>Now the above processes of tactuo-muscular synthesis do undoubtedly contribute to the understanding of the extension of things in space, as they are presented to us in experience. But do they really give us the ultimate <i>notion of space</i> itself? In other words, is space a notion formed by abstraction from these experiences of resistance and movement. Or do the above syntheses really suppose that we have the notion of space already implicit within our minds, and do thus consist merely in applying that notion to actual experience? This difficulty applies to other fundamental ideas such as <i>cause</i></p>

and constitutes a ground of difference between the experiential and rational schools of philosophy.

§ 63. In conclusion, it may be observed that muscular and tactual perceptions have these points of superiority over other forms of perception—

(1) That it gives a more immediate, intuitive irresistible conviction of the *existence* of extra-mental objects than any other form of perception; and, being less subject to illusions than the perceptions of seeing, hearing, etc. it is commonly appealed to as the surest criterion of objective reality (though illusions even of touch are not unknown)—

(2) That it alone gives a full and complete understanding of the *materiality* of extra-mental objects, (*i. e.* those primary qualities which make external objects to be material things, (for they might be *external* without being *material*). For though vision gives, we shall find, some of the geometrical qualities of matter (*vis.* extension and position in space of two dimensions), it fails to give the third dimension, *vis.* depth or distance outwards from self; and gives no clear perception at all of the dynamical qualities of things.

Tactual perception has, however, this defect, that it can reveal the existence of those objects alone which are within the range of movement, and can thus be brought into immediate contact with the organism; whereas vision, hearing, and even smell, have the advantage of revealing (though only *indirectly*, or by *inference*) the existence and qualities of distant things. And it is vision more especially that supplies what is wanting in touch. Hence we have to consider next—

Visual Perception.

§ 64. Vision is the highest of the senses in respect of discriminative sensibility, giving finer differences of *quantity*, *quality*, and *extensiveness* than any other sense.

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Characteristics of tactual-muscular perception.

Characteristics of visual perception.

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And, if we compare it with touch in importance as a source of knowledge, it will be seen—

(a) That it agrees with touch in giving *directly* an understanding of space in two of its dimension—*near and superficial*—while surpassing it in giving much finer discriminations of relative distance, direction, and position of points in line and surface than touch can do.

(b) It is inferior to touch however, (1) in this respect, that it fails to give *directly* the third dimension of space, *viz. depth or distance outwards* from self, and therefore to give an understanding of the *solidity* of external things; and still more (2) in this respect, that it fails to give *directly* any understanding of the dynamical attributes of things—their *resistance, weight, impenetrability*, and the like, and therefore fails to give by itself a full understanding of the *materiality* of external things.

(c) But on the other hand, vision has an advantage over touch, which enables it to supplement, and finally almost to supersede it—it gives a knowledge of *distant things beyond the reach of movement and touch*.

It cannot do so by *direct perception*, indeed, because directly it gives no understanding of distance outwards (movement of the limbs, combined with touch, being the only measure that we have of real distance). But it does it by *acquired* perception; because by the richness of its discriminative sensibility it gives numerous visual characteristics of things which become associated in thought with their *real distance, magnitude, solidity*, and dynamical qualities (*weight, impenetrability, etc.*), so that, when the visual characteristics are *presented*, they bring the real *distance, magnitude, etc.* of the things before the mind in *representation*; so that they are *thought* and *inferred* almost as rapidly and vividly as if they were themselves *presented*, or directly perceived.

§ 65. But there are two kinds of sensibility connected with the eye, *viz.*—(a) The *optical or retinal sensibility* which is peculiar to the eye—the consciousness of light, colour, and shade—occasioned by rays of

Two kinds of
ocular sensation.

Optical.

light emanating or reflected from the object, and *focussed by the lens upon the retina.*

When we turn our attention upon an external object, we roll the eye-ball so that the light from the object passing through the centre of the lens, may fall on the *yellow spot* near the centre of the retina, where the layers of retinal nerves and cells thin away, leaving the layer of crystalline cones more exposed to the light. This is therefore called the line of *direct vision*—object, centre of lens, yellow spot—while adjacent objects fall on surrounding points of the retina, and are vaguely seen, or *glimpsed, by indirect vision.*

(b) The *muscular sensibility* arising from the activities of the muscles of the eye—the external four *recti* (or straight) and two *obliqui*, which roll the eye-ball on its axes, and the internal *ciliary*, which regulates the convexity of the lens so as to focus light from different distances on the retina.

These muscles are richly supplied with both *out-carrying* and *in-carrying nerves*, which give a consciousness of the slightest degrees of effort and movement. And these muscle-feelings of the eye combine as sources of knowledge with the purely optical sensibilities of retina and optic nerve. For the qualities given by the optical sensibility, *viz.* light, shade, and colour, are only *secondary* qualities, and the co-operation of muscle-feeling in the form of movement is necessary to give an understanding of the coloured object as *extended*, and to make shade and colour understood as attributes of an *extended* thing.

§ 66. Hence if the optical sensibility *by itself*, gives only secondary qualities, the main thing to be explained will be, how the optical and muscular sensibilities *together give an understanding of extension* in two dimensions. Now—

(a) The *local discriminativeness* of the retina will contribute to this end, by contributing first (as that of the skin does) to the understanding of *co-existence*—every point having a certain *local characteristic* of its own, by which its sensations are distinguishable from those

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And muscular.

Ocular perception of space by synthesis of sensibilities.

Co-existence.

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Succession.

of other points ; and several points being experienced simultaneously, and at the same time felt to be distinct from each other.

Synthesis of
the two.

(b) Now suppose that the eye-ball be turned in its orbit, so as to bring a number of luminous spots, *a, b, c, d*, successively on the yellow spot (*i.e.* into the line of direct vision, or attention). These will at first give only events in time ; but if the movement be reversed, and be found to give the same series of optical points, only in reverse order, *d, c, b, a*, then we shall be prompted to apply our idea of co-existence, and explain this series of experiences by thinking of plurality of *co-existent* objective points, admitting of motion backwards and forwards between them ; *i.e.* by thinking them as a *line* involving an understanding of *extension in one dimension*. (And this conception will be attained more easily, perhaps, in the case of vision than in that of touch, owing to the fact that, even while the attention is fixed upon the one point which is in the line of *direct* vision, *e. g.* *a*, several other points will be making themselves vaguely felt at the same time on the outer parts of the retina, thus helping us to understand them all as co-existent with each other and with *a*.)

And when the understanding of lines of co-existent points has thus been attained, it will be even easier in the case of vision than of touch, to attain to the understanding of a *system* of co-existent lines, and thereby to an understanding of *surface extension*.

But vision can give no understanding of the third dimension of space (depth, or distance outwards), nor therefore of the solidity of things, because, though the eye can roll in its orbit so as to bring different points into the line of vision, it cannot move *forward* out of its orbit, to give any experience of distance outwards.

And the *apparent* or *retinal* magnitude of things (in two dimensions) will be measured by the *quantity* of ocular movement needed to bring their opposite ends or sides, one after another, to the centre of

Visual mag-
nitude only
angular and
apparent.

direct vision ; and the forms of surfaces, by the *kinds* of ocular movement needed to follow their peripheral lines.

But, though the eye can give the real *directions* of distant things, the *distances* and *magnitudes* which it gives are only *angular* ones. By turning on its axis it measures (with its muscle-feelings) the angles subtended by distant things, and by the distances between them, and thereby measures their *relative* and *apparent* dimensions and distances from each other ; but it cannot move outwards from its orbit to experience their actual distances itself, nor therefore their actual magnitudes. But their *retinal* or *apparent magnitude* will be found to supply to *acquired perception*, a criterion of their real magnitude, when their real distances as measured by limb-movement are already known ; and of their real distances, when their real magnitudes are already known.

Binocular vision, or the co-operation of the two eyes in the production of one mental image, presents some points of difficulty. Each eye is capable of giving an image of the object ; but when the eyes are concentrated on the object so that the light from it strikes the central spot of each eye, (or in otherwards, when the object is in the line of direct vision of both eyes at the same time), then the two retinal images coalesce into one image in consciousness. (When one of the balls is turned aside so that the light strikes on any other part of its retina, then the coalescence fails, and two images are seen).

Coalescence
of retinal
images.

The question is asked : *why, with the image on the retina inverted, do we see the object upright?* The question however involves a misunderstanding. Our conscious image has nothing to do directly with the retina, but with an unknown process in the brain. And the position of the mental image is determined by the relation of the object to our body as a whole, as experienced by tactuo-muscular perception, which is the ultimate criterion of external reality.

Upright
vision.

Perceptions of Hearing.

§ 67. Sound, with its distinctions of tone and timbre is only a secondary quality, not *directly* resembling anything in the nature of the object. But along with sound, hearing gives a clear *perception of time*, the common form of all *events*, mental and physical. All the senses give time, but hearing is the time-sense by pre-eminence

The *aural*
perception of
time.

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giving successive upits, durations, and intervals, more distinctly than any other sense. This is probably owing to the structure of the organ. The tremors communicated by the sounding object to the atmosphere, and by the atmosphere to the ear, have to be transmitted across the slender bridge of bones to the cochlea—from which it follows that the units of sound must be more purely successive than those of any other sense. (Our appearing to hear several sounds simultaneously, therefore, must be accounted for by the property of *duration*, *i. e.* the property which sound-sensations have of lingering for some time in consciousness (as *after-image*) after their objective causes have ceased).

And the understanding of succession may be explained to some extent in this way.—When a shock of sensation, A, has been experienced, but its objective cause (in the case of sound, the vibrations of a solid body communicated to the atmosphere) has ceased, then the after-image of the sensation *vis. a.* will continue to linger for sometime in consciousness before it sinks beneath the threshold. Suppose now that another shock of sensation, B, be experienced of the same kind. Then the actual present sensation *vis. B.* and the lingering remnant or shadow of sensation *vis. a.* will both be present in consciousness simultaneously; and the contrast between them will rouse the attention, and compel the mind to explain *a* by thinking of another sensation which was once present and actual as B, now is, but which has ceased to be present and actual. In this way it will awakened to a consciousness of the difference between what is *now*, and what is *no longer*; or between the *present*, represented in actual sensations such as B, and the *past*, represented in lingering traces or after-images of sensation, such as *a*. Here, then, we shall have the rudiments, at least, of an understanding of succession.

And the explanation thus suggested by the lingering *after-images* of sensations before they have sunk below the threshold of consciousness, will soon be extended to *revived* images of sensations, *i. e.* ideas, raised from beneath the threshold—the events of yesterday,

the day before, and so on—and an *abstract notion of time* will at last be formed, as of something containing within it, and making this possible through succession of events.

But the above account of time is open, it is to be feared, to the charge brought against the experience-theory of extension, that it assumes, rather than explains, the fundamental notion which it professes to explain—*vis.* the *notion of time* itself.

The other senses—*taste, smell, and organic sense*—give only secondary qualities, which are of less importance to knowledge, and do not require special consideration.

XV. ACQUIRED PERCEPTIONS.

68. In every perception of external things, after the very earliest experience, there is a *presented* and a *represented* element—a *cognition* and *recognition*. By the *present* sensation brings up former sensations of the same thing in *representation* (memory), *e. g.* the colour and roundness of the fruit, which I see with my eyes, brings up the touch, taste, smell, and name in idea. And in knowing that the *present* sensation marks a quality of an external thing, I know that the *represented* or remembered ones do so also—in *cognizing* that “that is a round, yellow thing,” we *recognize* it as having also the touch, taste, and name which are now present to our mind only in idea.

But there is this difference between the two cognitions (between the *cognition* and the *recognition*).—The cognition that there is an external thing having the power of occasioning my present sensation is an *intuition* or *immediate cognition*—such as an intelligent being may perform without previous learning or acquisition (for intelligence itself begins with the power of distinguishing between self and not-self, and their attributes). But the knowing that the thing has also other qualities which the sensation raises in representation—that “that round, yellow thing” has also certain

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The presented and represented elements of perception.

The one resting on immediate cognition.

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The other
on memory
and inference.

qualities of touch, taste, smell, etc.—is really an inference, and has therefore to be *acquired* or learnt by experience. I have found in previous experiences that such round yellow things had also such qualities of taste, etc. and from this I infer that this one has them also. Thus every complex perception involves an *acquired* or *inferential* element. Recognition involves inference. The directly *cognitive* element is *intuition*; the *recognitive* is the exercise of an *acquired power of inference*. What we have been calling the *representative* element of perception is an *acquired* element.

Thus all perceptions of mature life involve an *acquired inferential, representative and recognitive element*—an element of inference from what has been learnt in past experience. But there are certain acquired or inferential elements of certain perceptions which require special consideration, owing to their special importance as elements of knowledge. And these are *the acquired or inferential elements of visual and aural perceptions*. Hence—

Acquired Perceptions of Vision

The visual
perception of
distance and
magnitude

§ 69. Vision appears to have this advantage over tactual and muscular perception that it gives a knowledge of distant things beyond the range of movement and touch. When we stand on the top of a mountain, and look down on the plains, we seem to see the depth of space before us, and the comparative distances and magnitudes of forests, streams and towns, and of the clouds on the distant horizon. Yet we should have the very same impression, if we viewed the same scene skilfully painted on a flat sheet of canvas. And what is directly present to the eye in the real scene, as in the picture, is only a flat surface. How is it then that we see the distances and magnitudes of things?

Acquired by
association
and inference.

We do not strictly speaking see them at all, because the eye can give no understanding directly of distance outwards (depth or the third dimension)—movement of the limbs being the only measure we have of real distance.

But by the richness of its discriminative sensibility, it gives numerous visual characteristics of things, which we experience *by sight* at the same time that we experience their real distance, size, solidity, weight, hardness, and the like, by *muscle-feeling and touch*. Hence the visual appearances (colour, shape, etc.) of the thing, and its *tactuo-muscular attributes* (its size, solidity, distance, etc.), having been frequently experienced together, *become associated in idea into one whole of thought, so that when any one is presented again, it revives the rest in representation*. Thus when the visual appearances of the thing are presented to us again, they bring up the others, (*viz.* the size, solidity, distance, etc. of the thing) in *representation*; and we recognize the thing which possesses these visual appearances, as possessing these tactuo-muscular attributes also; *i. e.* we spontaneously *infer* that this thing possesses them now, as we found the same or similar thing to do in the past.

And this inference may come to be performed so rapidly and automatically that we are not aware that it is an inference, but mistake it for an intuition, and think that we *see* the distance, size, solidity, hardness, etc. of things, though we only *infer* them. Such implicit inferences involved in perception are sometimes called *acquired perceptions*. They are at least acquired *elements* of perception.

Now the acquired elements of visual perception are mainly—

§ 70. A. *The visual perception of the real distances of things.*—We have found that the understanding of distance outwards is acquired by movement of the limbs combined with touch, and that the only measure of real distance is the *quantity of effort in the form of limb-movement required to traverse it*. Judging the real distances of things by sight, therefore, supposes, (1) that we have already had experiences of different distances by limb-movement; (2) that we have observed and retained in our minds the different *visual* experiences, which things

Association between real distances and eye-experiences.

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Implicit infer-
ence of for-
mer from
latter.

Signs of
distance.

Feelings of
of ciliary
muscle.

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rising out of
binocular
vision.

Convergence.

have given rise to at different distances; and (3) that the *visual experiences* given by things have become associated in thought with their *distances*, (*i. e.* with the muscular effort of the limbs experienced in reaching them), so that the former may *suggest*, and enable us to *infer* the latter. Now the *principal visual experiences*, *optical and muscular*, which will thus become associated with, and suggest the real distances of things (as measured by limb-movement), are—

(a) The different degrees of muscle-feeling connected with the increasing and diminishing of the *convexity of the crystalline lens*, in order to focus, on the retina, the light from objects at different distances. This is done by the fibres of the internal or ciliary *muscle*, which forms a ring about the rim of the lens. The contraction of the fibres seems to distend, and thereby flatten the lens, adapting it to long distances, while their relaxation allows it to return more and more to its natural convexity, adapting it to short distances.

Now the feelings of the greater or less tension of the ciliary muscle become associated with, and suggest in thought the actual distance of the object, as measured by limb-movement.

(b) The different visual experiences (both *optical and muscular*) arising from the *co-operation of the two eyes* (in other words, from *binocular vision*) in observing objects at different distances, including—

(1) The muscular feeling of the greater or less *convergence of the axes* of the two eyes. When the object is near, the eyes have to be turned inwards, so that their lines of direct vision may converge upon it, and this is done by the *external muscles*. The nearer the object, the greater the convergence required; and the greater the distance, the less the convergence. These different degrees of ocular muscle feeling will become associated with the different distances as measured by limb-move-

ment, when both are presented together ; and the former will afterwards bring or help to bring the latter before the mind in representation.

(2) The differences of optical feeling arising from the *greater and less differences of the two retinal pictures*, which have to be fused into one compound picture in consciousness. The nearer the objects are, the greater is the difference of the pictures ; and the more distant the objects, the less the difference. And apart from the difference of the pictures, the combination of them into one mental image probably involves some degree of *mental effort*. Now these feelings of difference and effort, also, will vary with different distances, and will become associated with the distances as measured by movement ; and will afterwards suggest, or help to suggest them, to the mind.

All the above marks, it may be observed, apply only to short distances ; because for long ones the curvature of the lens and the retinal pictures will be nearly the same, and the axes will be nearly parallel. They have the advantages, however, of giving a more rapid and automatic cognition of distance than the following marks do, which apply to long distances, and involve a process of more or less *conscious inference*.

(c) *The apparent, or retinal magnitude* of the object (or more strictly, the *retinal angle* subtended by it) when the real magnitude is already known. Things of the same magnitude, subtend different angles at different distances ; and these apparent magnitudes, becoming associated with their real distances, afterwards suggest, and enable one readily to infer the distances.

Thus, we learn to judge approximately the distance of a person, a tree, an animal, or a building, because we have already an approximate knowledge of their size. But we cannot judge the distance of the moon or sun in this way, not knowing their magnitudes,

(d) *The greater or less distinctness or dimness of the object* in outline and detail.—The more distant it is, the

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etc.

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hazier and dimmer will it be. This mark enables one to judge approximately the distances of remote objects, such as woods and mountains, even without knowing their magnitude. But such judgments are liable to error, owing to different states of the atmosphere. In a clear atmosphere distant objects will seem nearer than they really are; in a hazy one, farther off.

The above are the more common marks of distance. There are others, however, such as the apparent *convergence* of lines known to be parallel (*i.e.* the two sides of a street), and *parallax*, or the apparent shifting of the position of objects as the observer shifts his own position, which, like retinal magnitude, is in inverse proportion to the distance.

Association
between the
visual ap-
pearances
and real
forms of
things.

§ 71. B. *The visual perception of the solidity and real form of things.*—To vision by itself all things appear flat, because they are directly perceived only as they are reflected on the surface of the retina. The power of *visually* perceiving their depth and solidity has therefore to be acquired; and it is acquired by forming an association between the *visual experiences* given by objects, and their *real form* in three dimensions as given by limb-movement and touch, so that the former may suggest the latter. And—

Feelings of
binocular
vision.

(a) In the case of near objects the sign most suggestive of solidity is supplied by *binocular vision*, or the co-operation of the two eyes, converging upon, and giving different images of different sides of the thing; and consists in (1) the feeling of the difference of the two visual pictures, and (2) that of the effort of combining them into one complex mental image, together with (3) the muscular feeling of the convergence of the axes. Limb-movement and touch give the *cause* and *meaning* of these different feelings, *vis.* the depth or third dimension of the thing, and its occupation of space in three dimensions. The above visual experiences become associated in thought with

the tactual and muscular ones from being frequently combined with them. Hence the former, when again *presented*, suggest their own interpretation (so to speak) to the mind, by raising the latter in representation ; and thus the visual impression of the thing comes to be accompanied by an understanding of its solidity and real form.

Hence, for short distances, the visual impression of solidity is very vivid. For longer distances it is less so, because the peculiar effects of binocular vision hold only for short and moderate distances.

The effect of binocular vision is illustrated by the *stereoscope*—a contrivance which casts two flat pictures of the same object, taken from slightly different points of view, upon the two retinas in slightly divergent directions, so that the axes have to converge slightly in order to receive them (as in viewing a real solid at a short distance). The difference of the pictures, and the feeling of convergence, (corresponding to those felt in observing a real solid) are found to produce a vivid illusion of solidity, being associated in our minds with the tactual and muscular experiences of solidity.

(b) For longer distances we depend on the same marks of solidity and distance by which the effects of *perspective* (our *seeming* to see the relative distances and forms of things in three demensions) are produced in pictures. A picture is but a plane surface, and yet gives an impression of the solidity and distance of the objects represented. This effect is produced—

Perspective.

(1) By the *apparent convergence of the lines and sides of things known to be parallel*. When we look at a cubical body of moderate size, e.g. a box, we can see three sides at once, and their boundary lines seem to converge. In looking at a mass of building we see two sides, and their lines coverge as they recede. These appearances interpret themselves to us, so to speak, by suggesting the real forms of the things, as determined by tactual experience. And—

(2) By *differences of light and shade*.—One side of an object is generally illuminated, and another in the shade ; and this visual appearance, having become associated with the real form of things, suggests its own explanation in the same way as above. And

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between
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nitudes.

the above special marks of solidity are re-inforced by usual signs of distance also, because the lines and angles of a solid object are at different distances from the spectator.

§ 72 C. *The visual perception of the real magnitude of things.*—This can be judged *visually* only when the *real distance* of the things is already understood. When the distance is known, the real magnitude is readily inferred from the *apparent magnitude*, or *retinal angle*. The greater the distance, the less will the retinal angle be, so that the larger the retinal angle subtended by an object at a particular distance, the larger must the object be.

But we cannot judge the magnitude of the objects, the height of distant mountains for example, from their apparent size, unless we have some means of first judging their distance. We cannot judge the magnitude of the heavenly bodies by merely looking at them, because we do not know their distance.

The above, then, are the *principal acquired* perceptions of vision. Others, however, might be added. Thus we learn to judge the weight, hardness, or softness, of things and even their temperature, taste, etc. from their visual appearances; and what have been called the *representative elements* of perception are all really acquired elements.

Visual illu-
sions.

Illusions as to distance lead to illusion as to magnitude also. When a thing which we know or think to be more distant has the same retinal angle as a nearer thing, we know it must be larger. Hence whatever makes us think a thing more distant than it is, makes us think it larger (the retinal angle remaining the same), *e. g.* objects seen through a mist. A clear atmosphere makes things seem nearer, and therefore smaller.

The moon near the horizon seems larger than at the zenith, because (1) the haziness of the atmosphere at the horizon and (2) the trees, buildings, etc. intervening help to make it seem farther off, while they leave the retinal angle the same.

Acquired Perceptions of Hearing.

§ 73. When objects are such as to produce atmospheric vibrations, and give rise to sensations of

sound, the quantity and quality of the sensations are found to correspond (1) partly to the *form, magnitude, structure, and quality* of the sounding object; and (2) partly to its *position* in space, *i.e.* its *distance and direction*, as previously ascertained by *tactual and visual* perception. Hence associations are formed between the aural sensations, and the tactual and visual images of things with which the mind is already stored, so that when the former are *presented* in experience, they bring up the latter in *representation*, and thereby give an understanding of the structure, material, quality, etc. of the sounding object. Thus—

(1) The different qualities of sound become associated with the material, shape, size, and visual appearance of the sounding object, so that when we hear a sound, it brings at once before the mind the nature of its objective source, and we distinguish whether it is a human voice, or a musical instrument, rustling leaves, a gun, a bell, and so on.

(2) The different degrees of sound become associated with the different distances of the sounding objects, so that when the object itself is already known by the quality of the sound, the degree of the sound gives us an indirect perception, more or less accurate, of its distance.

(3) The intensity and clearness of the sound varies also according as it falls *directly* or *obliquely* upon the ear. It is clearest when it falls *directly* on the ear; less so when it falls *obliquely*; and least so when it falls on the ear *opposite* to the sounding object. These differences also become associated with, and suggest the *direction* of the object, as understood by vision and limb-movement.

So much for the acquired perceptions of sight and hearing. The perceptions of the other senses are also accompanied by *representative* elements, and therefore by inferences, but these do not need special consideration.

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Association
between the
sounds of
things and
their dis-
tances, etc.

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XVI. THE LOCALIZATION OF SENSATIONS.

Double meaning.

§ 74. It is commonly said that in perception we *objectify* and *localize* our sensations. This expression, however, may mean either of two things—a localizing of sensations themselves by force of imagination, or a localizing merely of their *objective causes*. Thus—

Localizing sensations.

(a) We have acquired a habit of thinking of some at least of our sensations as actually *seated* in extramental things, *vis.*, as states or qualities of the things. Thus we think of the pain of the cut or the burn as actually seated in, or as a state of the injured part. We think of colour and temperature also as actually in the thing which occasions them, *e.g.* of the greenness as in the leaf, and of the whiteness and the heat as in the sun. This is *literally* objectifying and localizing the sensations (in imagination at least)—thinking them as objective qualities of things situated in certain localities of space. And this seems to be the common tendency of thought until corrected by reflection and science.

And localizing the causes of sensation.

(b) But we soon rise above this primitive tendency, and think of our sensations as what they really are, *vis.* states of our own minds, modifications of our own consciousness; but recognize at the same time, the fact that they have *objective causes* in some *locality* of space. Thus we soon come to understand that the secondary qualities at least are only states of our own minds, and that it is only their ground or cause that is in external objects. If we regard sensations in this light therefore (*i. e.* not as states or qualities of things, but merely as effects and marks of qualities of things), then objectifying and localizing them will mean nothing more than our explicitly ascribing them (by an *implicit inference*) to their proper

objective *causes*, in their proper positions in space; or *learning to understand the position in space, of the objects which occasion them.*

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But in whichever of these senses we may use the word localization—whether for the localizing of the sensations themselves (by an illusion of imagination), or only of their causes (by association and implicit inference)—there will be two kinds of localizing, *viz. localizing sensations in the organism, and localizing them (or their causes) in the extra-organic world.* Hence—

§ 75. *The localization of sensations in the organism.*—

Every sensation is specially connected with some part of the organism, and corresponds to some state of that part. Now we have a tendency to refer the sensation itself to that part, and think of it as seated in, and as itself a state of that part. And this is what is meant by localizing sensation in the body.

Sensations
thought as
states of
body.

V. 9.

This organic localization is least obvious in sight and sound because we have a tendency to refer these sensations directly to their extra-organic causes with no thought of their bodily organ. But it is more obvious in the cases of taste and smell, which we seem to feel in the tongue and nostrils, and is specially obvious in certain organic sensations and touch.

But we have found that the understanding of space and extension itself is given by tactuo-muscular sensation. Hence, before we can localize sensations in our body, we have to obtain our understanding of the surface and different points of the body from movement and touch, and localize the other sensations in the parts already mapped out by active touch.

(a) Hence the main question is: How do we come to understand positions in the body by movement and touch, so as to be thereby able to localize *touch-sensations*? When we once understand this, we shall be able to understand how the other sensations are localized in their proper places, by being associated with the touch-sensations of these places.

Localization
of touch-
sensations.

Now the localizing of touch-sensations depends on two conditions—

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qualitative
differences of
touch nerves.

(i) *It supposes local qualitative differences of the tactile nerves—i. e. that the touch-nerves supplying different portions of the surface differ somewhat in kind, so that their touch-sensations can be distinguished as qualitatively different from each other, even when they are experienced simultaneously.* Now there are such local differences of quality in touch-nerves and touch-sensations and they are most distinct, we have found, on the tongue, lips and fingers, and least so, on the shoulders and back.

And feelings
of muscles
and joints.

(ii) *[It supposes qualitative differences, also, of the nerves of the different muscles and joints concerned in different movements, so that different directions of movement (employing different muscles and joints) may give qualitatively different muscle-feelings, by which the different directions may be distinguished—(in addition to the quantitative differences which are the index of the range of the movements). Now we find that different muscles do give distinguishably different feelings, by which we can distinguish the different directions of movement.*

And asso-
ciation of
touch sen-
sation and
feelings.

Now with these conditions, we can understand how the relative *positions of points* on the surface of the body come to be understood. When the child touches any part of its body—its foot, chin, lip, or brow—with its hand, it has, in every case, (1) a locally different sensation of touch in the part touched, and (2) a different muscle-feeling, or set of feelings, in the muscles employed. And the muscle-feeling will differ both in quality according to the direction of the movement, and in quantity according to its length or range.

Now the different *local touch-feelings* of parts touched will, by association, gradually become integrated in thought with the different *muscle-feelings* of the hand and arm experienced in reaching and touching them. And these muscle-feelings will give the *length* and *direction* of the movements needed.

Hence, when any part of the surface is touched, the touch-sensation will at once bring up before the mind a

representation of the *quality* and *quantity* (the direction and length) of movement of the hand needed to produce that particular local variety of touch; and this representation, (when once the extension of the surface is understood), will be equivalent to understanding the locality of the stimulus. Thus the locality of a point on the surface is judged by the length and direction of hand-movement needed to touch it. Touching the knee requires one set of muscle-feelings, touching the brow another, and so on.

(b) The other sensations, again, can be localized in their proper parts by being associated with the *touch-sensations* of these parts. Thus a part which has been cut or burnt, can also be touched; and the touch-sensation of the part unites with the pain of the cut or burn, so that the latter is localized by means of the former. Hence internal pains cannot be clearly localized because the parts cannot be clearly affected by touch. Localization of parts by vision also depends at first on touch—parts seen are localized at first by touching them; but afterwards acquired visual perception of parts almost supersedes touch.

But why, we may ask, should the touch-sensation appear to be seated in the point of the surface touched? It is because there is a tendency to *associate a sensation always with its cause*. Hence, when arm-movement gives the locality of a *touch stimulus* on the surface, mind automatically ascribes the *sensation* to that part—thinks of it *as seated there where its cause is seated*. This also explains the tendency to localize colour, sound, etc. in the extra-organic world when it is once found that their causes lie there. Hence—

§ 76. II. *The localization of sensations (or their causes) in the extra-organic world.*—There is a natural tendency of mind, *to associate sensations with the part or object in which their objective ground or cause is found to lie, and think of the sensation itself as seated there.* This tendency goes so far that we localize some of our sensations outside the organism, in the extra-organic things which we have learnt to think of as their

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So that the touch suggests the movements.

Other sensations associated with and localized by touch.

Sensations thought as qualities of their external causes.

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grounds or causes, *e.g.* colour, sound and temperature more specially. In fact, what we think as the secondary qualities of matter, are really our own sensations objectified and localized in things by our own imagination—until reflection teaches us that this objectification of the sensations themselves is an illusion, and that what is in the things is only the powers of causing our sensations.

When this is understood, then the extra-organic localizing of sensations will mean nothing more than knowing the distances and relative positions of the things which causes them. And this is at first, we have found, by tactuo-muscular perception, and afterwards largely by acquired perceptions of sight (involving implicit inference).

XVII. THE OBJECT OF PERCEPTION.

Double meaning of the object.

§ 77. This may mean either of two things—the aggregate of conscious states (sensations and ideas) which are present directly to the mind in the act of perception, and reveal to us the existence and qualities of the external thing) or the *external thing itself* which *is revealed* in the act of perception.

The immediate object, a question of Psychology.

It forms the second most important question of *epistemology*, or science of knowledge (the first being that of the self), and involves therefore both a psychological and a metaphysical question—that of the conscious states, and that of the thing by itself. (§ 54, p. 170).

A. *As to the aggregate of conscious states* which manifest and reveal the thing, and which, being present in the mind in perception, are in a sense; therefore, the immediate content and object of consciousness in perceiving. These include—

(i) An aggregate of associated sensations, *presented* and *represented*—consisting of the actual *present* sensa-

tion, and the others which it revives in *idea*, as having formerly been *experienced* in connection with it, and which are understood to represent qualities of the same thing.

Thus most objects are capable of giving us, a plurality of sensations, visual, tactual, muscular, aural, etc. In the case of most objects, several or all of these sensations have been experienced simultaneously or in close succession, and may be repeated in any order, any number of times. Hence these sensations become associated together into one permanent whole of thought, and require to be explained as having their common ground, in a *single objective reality*. Thus a fruit, a flower, an ink bottle, a pen knife, give each its own peculiar cluster of sensations, which become associated together with each other and with our notion of substance, to form our conception of the thing. And when one or more of these are given in presentation, they not only (1) give us the *cognition* of a present external thing, but (2) raise in representation the whole associated cluster, thereby giving us the *recognition* of a *particular* thing.

And the ground-work of the cluster consists of those sensations which represent the primary qualities of the thing—its impenetrability, extension, form, weight, etc.—and which therefore constitute its *materiality*, or its essence as matter. The other sensations attach themselves, as it were, to these primary ones as their support.

(ii) *The notion and conviction of an external thing, entity or substance*, which gives unity and connection to the set of qualities or powers which occasion these sensations in us—so that our sensations, present and represented, manifest and reveal to us the existence of the thing and its inherent qualities. For we are unable to conceive of sensations or qualities as having independent existence of their own, apart from our minds or some other reality. We can think of them only as *effects, functions, manifestations* and must think therefore of something which *manifests itself* in them; and that something is what we mean by their *substance* or objective ground. Therefore in thinking the cluster of associated sensations

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Including
the cluster of
sensations.

And the
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as presenting (and representing) the qualities or powers of something, we necessarily supply the notion of, and believe in the existence of the *external reality* manifesting itself to us in them.

These factors then,—the sensations presented and represented, the notion of an external reality corresponding to them, and belief in its existence—may be said to constitute the *psychological object* or *percept*.

The revealed
or implied
object, a
question of
metaphysic.

§ 78. B. *As to the external thing itself, thus believed to be revealed in the act of perception* as existing independently of our sensations and ideas, (and which may therefore be called the *metaphysical object*).—Seeing that, in perception, we can thus conceive and distinguish an immediate *mental object in consciousness*, and an *object of knowledge* which exists independently of consciousness and whether we are conscious of it or not, what remains is to consider the *possible relations of the two*. It is on this question—the relations between the immediate object or content of consciousness and the external reality—the *psychological* and the *metaphysical object*—that the *theories of perception* turn.

Now the different possible hypotheses regarding the *metaphysical object* of perception seem to be these :—

Primitive
realism.

(A.) In the first place, it is possible to assume that the object outside and independent of our consciousness corresponds in all respects to the image or conception which we form of it within our consciousness, so that our conceptions will be copies of external realities in the same sense in which pictures are copies of their originals, or images in a mirror reflect their causes.

This *naïve* and *dogmatic realism* seems to be the primitive and popular belief; for the first tendency of the mind seems to be to objectify and think its sensations as actual qualities of external things, outside and independent of itself.

In this case the theory of perception (if any were thought of) would be that the external thing with its qualities are *immediately* present in consciousness, so that

there is no difference between the *mental* object and the *external* one. The thing itself will be the direct object of consciousness, and sensations themselves will be its qualities—*immediate* perception.

B. A little reflection, however, leads to a distinction between the *primary* and *secondary* qualities of matter—between qualities such as hardness, weight, extension, and the like, and qualities such as colour, taste, smell, and the like. It becomes possible, therefore, to think of colour, taste, smell, and the like, as only modifications of our own consciousness, and therefore as existing only in our minds ; and to think at the same time of extension, resistance, weight, and the like, as qualities inhering in things outside of our minds, (exactly as they enter into the conceptions of the things which we form within our minds).

In this case, we shall think of our conceptions of things as being exact copies of the things in respect of their *primary* qualities ; but admit at the same time that there can be no *resemblance of kind* between things and our conceptions of things, in respect of *secondary* qualities. What hardness and extension are in thought, that they will be in things independent of thought ; but colour, taste, and the like, being only sensations, will have no community of kind with anything outside of thought.

This *modified and corrected realism* is generally assumed by physical inquirers ; and also by many psychologists, chiefly on the ground that the *mind is so constituted* as naturally to believe in the reality of an extended and impenetrable extra-mental world, and that our mental faculties could not have been so constituted as to deceive us (Descartes, Reid, Hamilton). Materialistic thinkers also necessarily assume this hypothesis, because only in this way is it possible to maintain the ordinary conception of matter.

This view also will imply a theory of *immediate perception*, as far as the existence of the thing and its primary qualities are concerned. Thus Hamilton argues that we cannot be directly conscious of self and its attributes without being directly conscious of not-self, *i. e.* matter and its attributes, at the same moment,

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realism.

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ative ideal-
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and by the same act of consciousness. For cognition is possible only where there are two realities acting and reacting, and therefore both must be included as correlative objects in the same cognition. Hence, in perception, the external thing with its primary qualities must be the direct object of consciousness (along with, and in contrast with the self). The mental object and the external object are essentially the same; the primary qualities being the same both in consciousness, and out of it. Perception, therefore, is chiefly by means of touch and muscle-feeling, because it is they that bring us into most immediate contact with external things, and give us the clearest consciousness of self as acting, and not-self as reacting.

(C.) But it is possible to go further than this, and to say that there is no such essential distinction between primary and secondary qualities as is here assumed—that primary, like secondary ones, are to us only sensations or feelings of mind, objectified and ascribed to things as qualities by an automatic act of imagination; and that, as modifications of mind, they can have no resemblance of kind to anything extra-mental.

From this point of view, we may still hold that there is indeed an extra-mental world which is the occasion of our sensations; and even that our sensations, in their changes and relations, correspond in some way to external things; and yet hold that ~~sensations~~ and ideas can have no resemblance of kind to things—just as articulate sounds and written characters correspond to, and represent ideas of the mind, without resembling them in kind.

This *representative* or *phenomenal idealism* would correspond to the view of Kant in his "Critique of Pure Reason," if we were sure that by the "things in themselves," which he assumes as the ground and occasion of our sensations, he really *meant* extra-mental things. He appears, indeed, to have done so, but it is just possible that the following hypothesis was present to his mind.—

D. It may be said that there cannot be two

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Absolute
idealism.

forms of existence, mental and non-mental (mind and matter), each independent of, and external to the other. For, if they were thus independent of each other, neither of them would have anything in common with the other, and there could be no communication between them—mind could not act on matter nor matter on mind, so that knowledge would be impossible. We must therefore suppose that there is but one ultimate ground of being, and that that ground must be mental; and must conclude that nature is itself a product of mental energy,—and therefore that the energy which evolves the *little world* of percepts and ideas (the world of experience) within the finite mind, is identical in kind with the force which evolves the *great world* of nature, which is outside of and independent of the finite mind, and of which the *little world* of human thought is a finite reproduction.

In this case, there will be no extra-mental world, if by that we mean external to all mind. Nature will, indeed, be external to finite minds (as it is according to the other hypotheses), but will exist only *in*, and *by the activity* of a universal mental power. This hypothesis may therefore be called *pure* or *absolute idealism*.

This view in its earliest form was expounded by Berkeley, but has been worked out in other forms by the post-Kantian metaphysicians on grounds suggested by Kant himself. And it will have this advantage, that, according to it, our ideas of things will really have some resemblance to, and community of kind with the things themselves.

E. But still another position is perhaps possible. As all knowledge seems to be through feeling and sensation as its materials, it may be said that knowledge is *nothing more* than sensations and feelings; and that nothing is really thinkable or knowable outside the sphere of feeling and sensation, so that all attempts to think what lies beyond sensation will be self-destructive. The world will therefore be to us nothing more than a "permanent

Sensationism.

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possibility" of sensation ; things, only actual and possible clusters of sensations ; and knowledge, only the addition and subtraction of sensations, presented and represented (Hume and Mill).

But it is easy to show that every idea involves more than sensation, *vis.* a power of *interpreting* and *understanding* sensation. And as extremes are said to meet, so those who profess this *sensationist* and *sceptical* system (while pretending to know only sensations) are apt to assume that sensations are determined by universal and uniform laws existing objectively, and independent of all mind ; and thereby to assume a *dogmatic* and *realistic* view of the material world, identical with the first or second of the views given above.

These, then, are the different possible hypotheses regarding the metaphysical object of perception or external world ; but it is not the *psychology* of perception, but only *philosophy*, that can decide between them.

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CONSERVATION.

XVIII. RETENTION AND REPRESENTATION.

§ 79. Perception, or interpretation of sensations, forms the first step, we have found, in the acquisition of knowledge. The self exists as a mental principle by continuous action and reaction with the surrounding world; and is thereby undergoing continual changes of state. The consciousness arising out of the changes of state thus imposed upon it is sensation, and varies in kind and degree with the form and intensity of these impressions from without. And the self, in becoming conscious of its changing states as sensations, exercises, at the same time, its intellectual power upon them, and in or through them becomes cognizant *directly* of itself as the subject of them, and *indirectly* of a not-self or external world as the ground, occasion or cause implied in them. Knowledge thus begins with perception in its two forms, *internal* and *external*—the perception of self, as a reality directly or intuitively given in self-consciousness, as subject of sensations; and that of the external world, with its attributes and relations as the objective ground or cause of sensations.

But the perception of self and world is only the first step in knowledge for this reason, that perception is only a momentary act—the object perceived passes out of range of the senses, or attention is turned to something else, and this particular perception ceases. Now, if percepts thus vanished immediately, and left nothing behind them, knowledge would be impossible. Knowledge supposes *the results of many perceptions, preserved and*

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organized into a system of ideas corresponding in order and connection to the system of things constituting the world; and capable of being reproduced in consciousness any time when wanted. How is this possible?

This is possible only on the supposition that the mental principle has not only the power of perceiving things, but also of preserving the results or effects of the perceptions in an unconscious way, and of reviving or reproducing them again in consciousness in the form, not of *percepts* (which suppose the presence of the object), but of *mental images, ideas or representations of percepts* (in the absence of the original object).

Various
terms used.

* This power of retaining and reproducing the results of past percepts or experiences in the form of ideas, mental images, or representations, is known by various names, such as *reproduction* (implying that the new consciousness is not indeed identical with the old, but involves a new effort of the mind applied to the effects left by the old); *representation* (because, as the original percept may be said to *present* the thing to the mind, so the renewed form may be said to *represent* it); and *imagination*, or power of forming *mental images* of things in the absence of the things themselves, (for, though the word *image* would apply literally to copies of visual percepts, because a literal *image* is a visual thing, yet it may be extended to include all concrete reproductions of percepts—tactual, auditory, and the rest).

Imagination, indeed, in common language, is used, not for all concrete reproductions including memory, but only for those in which the images are reconstructed into new combinations; but most writers now use it in a comprehensive way to cover all power of reproducing and representing experiences in the form of *concrete mental imagery*, and therefore to include memory and expectation as well as imagination in the common sense.

The above terms, however, have this defect, that they cover only those elements of past experience which are revived again in consciousness in the form of distinct ideas. It is only a small part of experience, however, that is thus revived. Hence the term *Conservation* is more appropriate for the integrative and retentive functions

of mind than the above, because it covers what is preserved in the mind sub-consciously, as well as what is raised again as distinct ideas.

§ 89. Now the conservation of past experiences will include the following functions.—

I. *Retention* itself, which is the basis of all the rest. We have reason to believe that practically all experiences leave effects or "traces" behind them, which become integrated and incorporated, so to speak, into the mental system, and help to determine its character for the future. There is no reason why the law of the conservation of forces should not apply to mental, as well as to, physical forces. These effects or traces, indeed, are not all susceptible of being raised into distinct consciousness again as separate ideas and feelings—only a comparatively small number are so revived. The great mass remain latent and subconscious (below the threshold, so to speak). But whatever enters into consciousness—our conscious ideas, feelings, volitions—rises out of the constantly accumulating mass of the subconscious contents of mind, and are the product or resultant of them. Subconscious retention, however, is the most obscure and mysterious of all the phases of mind. (§ 23, p. 79).

* Nevertheless from the obscure mass of latent "traces," some are capable of being raised under certain conditions into consciousness again as *distinct ideas*; and thus retention is the basis of memory.—

II. [*Memory*, called also *reproductive imagination*, is the reproduction and representation of past percepts of things in *the same form, order, and connection in which they were originally experienced*, together with the *recognition* of them, as having been experienced by ourselves at some particular point of past time.] It includes, therefore, the power (i) of *reproducing* and *representing* past experiences of our own in the form of mental images, having the same order and connection as the original

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conservation.

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ation in con-
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percepts; (ii) of *recognising* these images or ideas as *representations* of actual past-percepts of our own; and (iii) of referring the experiences which they represent to their proper position (approximately at least) in past time (*locating* them, so to speak, in time). (iv) *The Power of re*

* Memory is also called *reproductive* and *representative imagination*, because it reproduces and represents real past experiences in the form of mental images or concrete ideas. ~~It is not free~~, like artistic imagination, but limited to *facts* by the consciousness of having experienced them.

Past experiences may be reproduced, however, without recognition of them as being experiences of ours at any particular time. Reproduction of this kind has been called *fantasy*, and forms a step to the next phase of conservation.

For ideas of past experiences revived in memory become objects of mental activity, and may be taken to pieces and put together by it again in new forms, so as to represent possible experiences which we have never ourselves experienced. Hence *memory* is the basis again of—

Reconstruction
in
consciousness
including

III. *Reconstruction, or productive imagination*—in which the materials of past experiences are reproduced indeed, but instead of being left in the same order and connection in which they were actually experienced, are *reconstructed* and *recombined* into images and groups of images, different in form and order from what has been experienced in the past. This process of reproduction combined with reconstruction includes, again, two forms, in one of which reconstruction is restricted within limits prescribed by memory and reasoning, while in the other the constructive power operates freely. These are—

Imagination
of the past,
possible and
unreal.

(1) *Imagination* proper—as distinguished from memory and expectation,—which supposes as its condition the conservation and reproduction of the materials of past experience (though it may be in the form of *fantasy* without any recognition or reference to time, rather than that of memory proper); and consists in recombining

and reconstructing them into new images, and combinations and series of images, different from any that we have experienced in the past (memory), or expect to experience in the future (expectation).

* But even this comparatively free form of construction takes different forms, of which the principal are—

Historical and scientific imagination, which consist in constructing images of things which we have not seen, but in conformity with descriptions and evidences supplied to us by the historian and scientist, so that we believe our images to agree approximately with reality as it has appeared to others, and would have appeared to ourselves, had we been present. This kind of construction, therefore, comes nearest in its nature to memory and expectation, aiming at agreement with real experience, and based on evidence and reasoning. Thus when we read of Hannibal's passage of the Alps in Livy, or of the trees and animals of geological times in Lyell, we have to exercise our constructive powers, but in conformity with materials supplied to us, and prescribed limits which we must not transgress. And—

Free artistic imagination, fancy, poesy, which is not restricted by limits of actual fact, but constructs images which are not known to correspond to any real thing that has been or will be (unless we realize them ourselves in a work of art), without being restricted by any other limitations than those of good taste, or any other purpose, it may be, than the pleasure of mental activity—the trains of agreeable ideas and feelings to which they give rise—as e. g. the banquet in "Macbeth," the island of the "Tempest."

(2) *Expectation or anticipation*—which consists in constructing, out of reproduced materials of past experiences, mental images believed to be representations of things and events which will occur in our own future experience—images not of what has been, but of what will be experienced by ourselves.* Images of anticipation, therefore, are not *recognized* as representing past realities, but *believed* to represent future ones; and the corresponding events, therefore, are localized not in past, but in future time.

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Restricted by
evidences.

Unrestricted.

And antici-
pation of the
future.

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Restricted by
inference
from past to
future.

But, as future events are never expected to be exactly like past ones, therefore the images or ideas which we form of them, though made up of materials derived from the past, will have undergone a certain amount of *modification* and *reconstruction*, to make them agree with future conditions. Therefore expectation will have to be included under the head of *productive* or *reconstructive* imagination.

• Expectation, therefore, is to future time what memory is to past. But the *belief* which it supposes does not rest on the evidence of past consciousness, but on *inference from the "past to the future"*. Remembering what happened in the past, we infer from that what will happen in the future. Thus as *memory* is restricted to facts by the consciousness of having experienced them, expectation is restricted to facts by reason, or power of inference from past to future.

Hence inter-
venes be-
tween thought
and emotion

But it is evident from its relation to reason that *expectation* or *anticipation of the future* though it is a process of concrete construction, occupies a different place in the circuit of mental processes from memory and free imagination. The great object of thought is to enable us to foresee and prepare ourselves for the future. It consists essentially in using the past and present as means for reasoning forward to the future. Now foreseeing the future means constructing ideas beforehand of what will happen in the future. Hence *anticipation* is a result of reasoning and the form into which the highest results of thought are cast. And this anticipation of the future again is the source of emotions such as fear and hope, and therefore of desire and motive, and thereby of volition and conduct. Therefore the proper place for considering *expectation* will be after the *reasoning processes*.

Therefore we have here to consider *Retention, Memory and Imagination*.

XIX. RETENTION AND MEMORY.

Memory or
representa-
tion.

§ 81. Memory, then, is the power of reproducing in the form of ideas or mental images, things and events formerly experienced by ourselves in reality, and of recognizing these images as representations of things

and events experienced by ourselves at some point of time in our past lives.

It implies therefore, (i) the raising of certain ideas into consciousness, and keeping of them there for some time, as materials of thought; (ii) the recognition of these ideas as reproductions or representations of past experiences (percepts) of our own; (iii) a conception of time, and of the series of experiences in time constituting our past life (as implied in recognition); (iv) reference of the experiences thus reproduced and represented to a more or less definite position in the time-series of our life (a localization of them, so to speak, in time), for mere revival of images reproducing, more or less, past experiences, but without recognition and time-reference, would not be memory, but only fantasy; and finally, (v) it includes a consciousness of the self as the permanent subject of these successive experiences in time, for without this, recognition would be impossible, and memory meaningless. For it is memory more than anything else that brings out the permanence and identity of the self. In reality, "memory is memory of self, and not of things"—or more strictly of self as experiencing things.

Thus between memory and perception there is both difference and analogy. In perception we have a cluster of *actual* sensations, and cognize in them the immediate presence and operation of external things. In memory we have a cluster of *represented* sensations, and cognize in them our past cognitions of things.

Memory is not, therefore, a reproduction of sensations merely. The sensation is reproduced to some extent in the memory-image; but it is not memory unless accompanied by a revival of the *cognition* of the things implied in the sensations. Therefore memory is of *percepts* not of sensations merely. Sensations do not revive without effort of the cognitive power, of which they are the materials.

What then is the nature of the *memory image*, as compared with the original *percept* and with the *sensa-*

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tions contained in it? According to Hume, the idea of a colour, sound, or taste that I have experienced, is simply a fainter repetition of the original sensation, and differs in nothing except in being less *vivid* and *intense*, i.e. in *degree* only. For when ideas are by any means intensified, as in illusions, then they are mistaken for percepts of present things.

Others have gone to the opposite extreme and said that the idea has nothing in common with the sensation. "The idea of the brightest radiance does not shine; that of the loudest noise has no sound; that of the greatest torture produces no pain; and nevertheless the idea represents the radiance, the sound, and the pain, though it does not actually reproduce it."

The truth probably lies between these extremes. Ideas seem, indeed, to affect the brain, and perhaps the whole organism, in much the same way as sensations; and therefore it can hardly be true that ideas and sensations are wholly incommensurable. But in sensation the initiative comes from without, and mind is *forced* to co-operate; whereas in ideation, the initiative (the reviving energy) comes from within—the idea is a spontaneous mental representation for mental purposes. It is felt, however, to be *only a representation*—a raising into consciousness of what is already latent subconsciously in the mental system—and not a *free reconstruction*.

There are evidently, then, two main questions with regard to memory—(I) *how past experiences and acquisitions are preserved or retained subconsciously* in the interval between their first sinking out of consciousness, and their representation; and (II) *how some are represented when wanted in the conscious form of ideas or mental images*.

* Some writers, however, dismiss the question of retention as unnecessary. When percepts pass out of consciousness, "nothing remains latent in the mind, but the power of reproducing them" (no effects, "traces," or "vestiges"). Knowledge of the past exists "not as a mental state, but only as the capability of being put into a mental state" (Mill). But mind has not only a power and capability of reproducing percepts, but also a *tendency* and *impulse* to reproduce them. What, then, makes it to have this power and impulse? Why has it ideas of its own past experiences more

Two main questions—
retention
and representation.

than of other things? Surely there must be some bond of connection between past and present experiences, otherwise they could not be represented as one continuous life. (The question of conservation, therefore, comes to be much the same as one considered before, *viz.* what makes the unity and continuity of the self—its personal identity?) Hence—

Retention.

§ 82. *The question of the Retention of past experiences and acquisitions, so as to make their subsequent Representation possible in some cases, in the form of distinct ideas.*

I visit, one day, the Museum or the Botanic Garden. Months and years afterwards, the experiences of that day revive in the form of ideas. Where have they been in the interval? A person is said to have an extensive knowledge of languages, sciences, or history. But only a very small portion of this is ever present in his thought at once. How then does he retain it, and carry it about with him? How are the events of our past lives preserved when we are not thinking of them? Where are the experiences and acquisitions of our past lives in the interval between their first sinking out of consciousness as sensations and percepts, and their reappearance as images or ideas?

The question of retention may be considered under two heads—*first*, how experiences *sink out of consciousness* into the state of subconscious latency; and *second*, how they are preserved in *an unconscious or subconscious way*, ready to be revived again when wanted. Hence—

1. In this subsidence below the level of consciousness into this supposed state of passive latency two stages may be distinguished:—

✱ (1) *The state of after-image, after-percept, or after-sensation.*—All sensations possess, more or less, the quality of *duration*, *i. e.* of lingering for some time in cons-

The question how past experiences are retained below the threshold of consciousness.

Their subsidence below the threshold.

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First stage of
subsidence—
the after-
image.

consciousness, after their external cause has ceased to operate, gradually sinking in degree, until they sink out of consciousness altogether. It is as if the organic and mental process once set agoing, went on of itself for a time without stopping, like a revolving wheel. Thus if we look at the sun, and then turn away, the image persists for some time in our consciousness, so that we cannot get rid of it. When the wheel of colours is made to turn rapidly, the different colours fuse into the single sensation of whiteness; when the burning stick is whirled round rapidly, it gives a continuous ring of fire; because the successive impressions linger so as to become simultaneous, and combine into one consciousness.* Tastes and smells have this quality in a high degree; colours and sounds in a less degree, and touch perhaps least of all. Duration depends greatly, however, on the intensity of the sensation; when it is faint, the duration may be imperceptible.

Visual after-images have this peculiarity, that they tend often to change into their negative or complementary shades. Thus the after-image of the sun tends to become black; that of a dazzling red colour will become of a yellowish green. This change probably has a physiological cause. The nerve fibrils employed become exhausted by the intensity of their work. In the case of the white image of the sun, all the fibrils are engaged, and when they are exhausted, their activity is dissipated and lost altogether as light, and negative blackness is the result. But the red colour engages only part of the fibrils, and when they are exhausted, their activity passes over into the fresh remainder, producing the complementary colour, yellow-green.

Second stage
—the recur-
ring image.

(2) Another stage anterior to the passive latency of ordinary retention, is that of the *recurrent* or *temporary image*. An experience, after being suppressed below the threshold of consciousness by the constant irruption of other impressions, may yet retain its persistent force in some way, even out of consciousness; and

for a long time have a spontaneous tendency to force itself back into consciousness again—as bubbles under water tend to force their way to the surface, or as an elastic ball rebounds by its own elasticity. . .

Thus a deep sorrow may be driven out of the field of consciousness by work or amusement for a time ; but as soon as the excitement of work or diversion relaxes, it forces its way back again by its own elasticity. Hence people often seek different kinds of engrossing work or diversion, *e. g.* write books, or go on long journeys, in order to suppress painful thoughts.

• It is a question whether impressions always retain, even below the level of consciousness, some degree of elasticity, or spontaneous tendency to force their way back of themselves. Some regard the effects left by experiences as so many forces acting and reacting on each other, and, though suppressed below the threshold by the incoming of new impressions, and by their own rivalry, yet ever struggling to force their way to the surface again, like bubbles in water. This theory of subconscious ideas as forces has been worked out by Herbart and his school, who have expressed these supposed interactions in elaborate mathematical formulæ and attempted to construct an elaborate statics and dynamics of mind.

"I discovered," Herbart says, "that the elementary ideas of an intellectual being, if they are ever to rise to the pitch of consciousness, must be wholly or in part opposed to each other, and must check or block one another in consequence of this opposition ; and that, though held in check by their mutual opposition, ideas are not on that account lost, but continue to exist as endeavours or tendencies to rise to the condition of conscious ideas, as soon as the check ceases to act. These checking forces could and must be susceptible of calculation ; and thus it became clear to me that psychology requires a mathematical, as well as a metaphysical foundation."

(3) But it is now generally assumed (whether rightly or not) that there is no such thing as interaction of latent ideas, and that when impressions have

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The spontaneity of mental traces.

Em.

The Herbartian psychology.

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sunk below the stages of after-image and recurrent-image, such effects or residues as may be left of them loose all spontaneity, and sink into mere passive, inert "traces" or "vestiges," which would never rise into consciousness again at all, if they were not stimulated by other influences flowing into them, and reviving them. And *memory proper* is regarded as a process by which these purely passive "vestiges" are stimulated into activity again, and raised into consciousness as ideas or images of the percepts which left them.

* The next question, therefore, is consider the nature of these supposed unconscious *traces* or *vestiges*, in which past experiences are preserved ready to be revived again in conscious memory.

The vestiges left by past experiences—are they bodily or mental?

§ 83. The main question, therefore, with regard to retention is the question, how percepts or experiences after sinking out of consciousness, *continue to be preserved below its level in the form of subconscious "traces" or "vestiges,"* (or whatever the effects which they leave behind may be called), so as to be capable of being reproduced again as memory-images. *What and where are these traces or vestiges?* There are two principal theories on this subject—(a) the theory of conservation by means of *cerebral modifications*, and (b) the theory of *subconscious mental modifications*.

That they are retained as modifications of brain.

(a) The answer of most psychologists at present, even of such as pretend not to be materialist, consists in an appeal to more or less imaginary states and processes of the brain. *All* conscious experiences are accompanied by processes of brain; and after they sink out of consciousness, the brain-process, they say, still goes on, though in a fainter degree, as the wheel once set going continues revolving by its own impetus; and either (i) *continues to go on, on a small scale, in some remote cells and fibres of the cortex*, until afterwards reinforced, and stimulated to wider activity again; or (ii) at least leaves some per-

manent *re-arrangement of molecules and some modification of the structure of some part,* which produces a tendency to renewal of the same activity again, producing the same consciousness. (p. 79.)

• Hence, when experiences pass out of consciousness, nothing remains of them except certain effects which they leave in the brain; and these brain-traces are the means of their revival as images of memory and imagination. There are however several different forms of the brain theory. Thus there are:—

(1) The theory of conservation by *permanent vibrations in the brain*.—The conscious percept results from, or is accompanied by vibrations of fibres and molecules of (perhaps) the whole brain. But as the force of vibration subsides, the accompanying consciousness fades away, and the vibrations themselves become restricted to some particular cell or ganglion; which goes on vibrating, however, until, in course of time, new energy is communicated to it; whereupon the vibration spreads again, and makes the feeling revive in the fainter form of memory. When the vibrations fade away altogether, then revival is impossible.

To this may be added the more grotesque theory of *phosphorescence*. Feeling rises out of a combustion of phosphorus in the brain. As feeling fades, the phosphorescence becomes restricted to certain ganglia, where it may go on for a long time, however, and may be stimulated again to wider activity, and thereby to consciousness again. "Thought is phosphorescence."

(2) The theory of conservation by *permanent modifications of brain structure*.—The brain activity which accompanies consciousness dies away altogether with the after-sensation and recurrent-image, but leaves some permanent effect behind it, in a re-arrangement of the molecules and modification of the cells and fibres of the brain, or of some part of it. This re-arrangement is an adaptation of structure which makes a renewal of the same activity easier at any future time. Hence when a slight stimulus of the same kind is applied, the cells and fibres repeat the same activity as before, and give rise to the same consciousness, only in the fainter form of memory.

Thus memory is identified with *habit*. As by repetition, the limbs come to repeat the same movements easily and rapidly; so the brain cells and fibres, having

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As "unconscious cere-
tion.

Or as modi-
fications of
brain struc-
ture.

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Difficulty of
supposing
thought to be
preserved by
brain.

gone through a set of activities several times, comes, by adaptation, to repeat them at the slightest stimulus, giving rise to the same form of consciousness as before. "Retention is not a fact of the *mental order* at all; it is a purely *physiological* phenomenon, a *morphological* feature."

But* these brain-theories are open to all the objections urged against materialism in general. They assume that every revived idea is a creation out of nothing. The analogy between memory and habit is false. Habit is a process by which work, originally conscious, becomes automatic and unconscious; memory, one by which unconscious states become conscious and rational.

Again, we have found that all states of consciousness are in their ultimate elements the same, and must involve essentially the same brain-processes; and that every idea and feeling is so correlated with other ideas and feelings as to require the co-operation of the whole brain, and perhaps of the whole organism. It is impossible, therefore, that particular ideas and feelings could be stored up in particular cells, like articles in a museum. Even if they continued to exist only as brain processes or states, still the co-operation of the whole brain would be needed for their preservation.

In fact it is as difficult to think of past thought as preserved in modification of brain as it is to conceive of past sounds and illuminations as preserved in permanent modifications of the atmosphere, or luminiferous ether. Brain does, indeed, undergo modification in course of development, but its modifications are *collective*; and do not correspond to particular ideas, but only to general and collective powers and tendencies of thought and feeling.

Finally, the brain processes assumed are purely imaginary; and far more is ascribed to brain, than any set of molecules, working according to any known laws of physics, are capable of performing. The psychology, therefore, which explains everything by brain processes is mythology, rather than science.

(b) The other attempt to explain mental conservation is by the theory of *unconscious* or *subconscious mental modifications*, which seeks to explain them without going outside of mind, or appealing to any other kind of reality than mind itself. *Consciousness* (at least clear consciousness) is not co-extensive with mind; and "out of consciousness" is not "out of mind." When percepts

That they are
retained as
subconscious
mental modi-
fications.

cease to be conscious, the mental process which made them is still going on as before, only in a degree too faint to be distinguishable, and therefore unconscious, or at least subconscious (if there be any difference). Or even if they cease to be active processes, they leave some permanent modification of the system of mental powers as a whole, so that mind retains permanently the power and tendency to think these thoughts over again. Hence the conscious idea, feeling and volition does not spring out of nothing, nor sink back into nothing again. It is a resultant or product of a mass of tendencies or forces *which are themselves mental*; and which, for want of a better term, we may call *unconscious* ideas, because they tend to make, or to become *conscious* ones. (p. 80.)

* For an idea is never remembered alone and by itself, but always as part of a connected system. To mind, past and present are a single connected whole, and the past lives in the present; so that the connected series of experiences forming the life of the self, are still contained implicitly in the constitution of the self, and are liable to be renewed or reproduced from within the self. The idea is not a fainter repetition of the sensation from without, but a reproduction of the percept from within. This is especially obvious in the case of abstract ideas. And if this organized subconscious system of forces and tendencies were not itself mind, it is inconceivable how it should ever become or produce mind.

But this account of conservation does not really pretend to be an *explanation* of it. It merely shows that retention and memory are involved in the essential nature of mind, and *cannot be fully accounted for* without an exhaustive understanding of the ultimate nature of mind itself, which is unattainable; and serves to exclude false and deceptive explanations, such as the brain theories. So much for conservation. We come next to—

Representation.

§ 84. II. The question of *the revival of past experiences and acquisitions* from the form of *unconscious effects* or

Representa-
tion of the
past—
Memory
proper.

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"traces" (whatever may be their nature) and their Representation in the form of conscious images of memory.—It is not enough that the past be retained in a latent form; it must be raised into consciousness again when required.

It is doubtful how far impressions, after they have sunk out of consciousness, retain (as latent traces) any elasticity of their own, or tendency to force themselves back again into consciousness, as Herbart assumed.* It seems certain, however, that reproduction is in most cases due to an influence applied to the "traces" or "vestiges," tending to stimulate them into renewed activity, or, at least, to remove whatever obstacles repress them, and leave them free to revive of themselves.*

The reviving
force.

What influence, then, is it that enters into the latent traces of past experiences, and causes them to rise into consciousness again as memory-images? (or, perhaps more correctly, what influence leads the self to turn its activity into these traces, and repeat these forms of consciousness?)

Suggestion
arising from
association.

The answer is that it is the influence of Suggestion, operating according to what are called the Laws of Association.

What then are Suggestion and Association, and what is implied in them? When we say that a percept A suggests by association the idea *b* (as *e. g.* the sight of a fruit tree suggests the colour, taste, and smell of its fruit), or that the idea *b* suggests another idea *c*, (as the idea of a poem suggests the idea of its author, and the circumstances under which it was written)—it is meant evidently that every percept and idea has the property of guiding and urging on the mental activity into another idea, and that, into another, and so on. And we explain this suggestive property of an idea by saying that the percept or idea is associated with the other ideas which it suggests.

For the conscious activity of the self, when not wholly engrossed with new impressions from without, must occupy itself with its own past experiences, and must flow into the traces of one after another in what may be called the line of least resistance (which will be the line of most intimate connection). And *this connection of percepts with latent ideas, and of ideas with other ideas, which enables one to overflow into, suggest, and revive another, is what is called association.*

Now we can explain this connection between ideas, and consequent property which ideas have of suggesting other ideas only by supposing (i) that all the experiences of life, as being the experiences of a single self, and modes of one continuous consciousness, are connected together into continuous groups and series, And (ii) that when they sink out of consciousness they leave behind them effects or "traces" in the mental system (whatever may be their nature), which are also connected together in subconscious groups and series, corresponding to those of the original experiences. And (iii) that when consciousness has been occupied with a particular percept or idea, its activity flows on continuously from that (as by the line of least resistance) into the traces of the next most closely connected experience, and stimulates these into renewed activity, and so on—raising one latent idea after another into consciousness in the order of their subconscious connections (which is also that of the original experiences)—until interrupted by a new sensation breaking in from without. The new sensation will turn the activity of consciousness first to itself, and then into some new line of latent ideas connected with itself.

Explanation.

Thus, that the percept A, suggests the idea *b*, and that the idea *c*, and so on, means that the mental activity engaged with A overflows into the trace *b*, and thence into *c*, and so on, owing to connections established between them in experience (called associations), and preserved in their subconscious traces. Thus the taste of a peach may suggest the idea of a pear; and that may remind one of apples; and these, of a particular garden where he has seen apples growing; and that, of the name, appearance, residence, and history of the proprietor, and so on. But while the activity of thought

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Laws of Association and Suggestion.

is flowing along this line of suggestion (this series of connected traces), a new sensation may force itself into the mind from without, interrupt this series of suggestions, and begin a new series. Thus you may hear a sound, and perceive that it is the 1 o'clock gun. This new percept will suggest, perhaps, the duties of the afternoon, and set the consciousness flowing along a new line of associated ideas, *e. g.* the street, the college building, the class-room, the teacher, the books and subjects, and so on, until some new interruption makes a new beginning.

§ 85. Association, therefore, is *the bond of connection between percepts and ideas, and between ideas and other ideas, which enables one to suggest another, i. e. to guide and urge on the thinking activity from itself to the other.*

Hence there will be as many *forms of suggestion* as there are *bonds of association* or connection between ideas; and *Laws of Suggestion and Association will be general propositions expressing the truth that ideas suggest or raise other ideas into consciousness by virtue of certain (subconscious) bonds of connection between them.*

Or to distinguish them more precisely, a Law of Association, therefore, will be a general proposition expressing the truth, that when things and events are related in a certain way in experience, their subconscious traces and conscious ideas will become related in a corresponding way in the mind. And a Law of Suggestion will be a general proposition to the effect that when ideas have become related in this way in the mind, then when one is raised into consciousness again it has a tendency to raise the other along with it.

What then are the different bonds of connection between ideas, and the different *Laws of Association and Suggestion*? They are commonly stated as three in number—the Laws of *Contiguity*, *Similarity*, and *Contrast*.

I, The Law of Suggestion by *Contiguous Association*,—is that things experienced simultaneously, or in close succession, so as to form one connected whole of experience, tend to coalesce together, and form one whole of thought also, so that when any one of them

The Law of Contiguity.

is afterwards brought before the mind, it tends to bring up. (suggest) the rest in idea, as parts of the same whole.

Thus when mind has become familiar with a certain whole in experience, and part of that whole is again presented, then it spontaneously fills up by *representation* the part wanting in the *presentation*.

Thus, the colour, touch, taste, smell, shape, structure and size of an orange, having been experienced so often together as one complex whole of sensation and perception, have become so connected in idea that we cannot experience, nor even think of any one of them, without that one's bringing up all the rest along with it. And thus the *sight* of an object at a distance revives automatically its touch, weight, size, distance, (and sometimes its taste, smell, or sound), without our being clearly conscious of the fact that these ideas are revivals at all, and without any notion of the time when they were experienced. (For the bond of association may be so strong that we fancy that we actually *see* the distance, magnitude, weight, and tactual qualities of things, forgetting that these are really experiences of other senses, and merely *revived in idea* by the visual appearances of the things, through force of association and suggestion).

Revival by contiguous association is therefore evidently a case of *redintegration*, or the filling up of a whole of which only part is presented. When I see an arc of a circle, I cannot help supplying the rest in idea, otherwise I should not know that it is part of a circle. Thus an aggregate or series of experiences may become so connected together into one whole in idea, that I cannot think of part without filling up the whole. This tendency of the mind to redintegrate, or supply what is wanting, seems to constitute the *suggestive* force, which both prompts and guides the thinking energy to revive latent elements of experience.

We can explain this revival best by the hypothesis of subconscious traces, corresponding to the experiences. Let capital letters represent actual percepts or sensations, and small ones, their traces or vestiges. Then if A, B, C, D, be a connected group or series of experi-

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Association is
integration
and sugges-
tion is redin-
tegration.

Symbolical
explanation.

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ences in the past, they will have left a connected system of traces in the mental constitution, *viz.* *a, b, c, d.* Then if the percept A, or some one like it, be renewed at any time, the activity of A will revive and absorb into itself the vestige of its own former self, *viz.* *a,* (thus becoming A *a,* and rendered fuller and clearer by this amalgamation with the effects of former experience). But then the activity of A will overflow from *a* over into the connected trace *b,* and reinforce and stimulate it to renewed activity, as an image of the former percept B; and from *b,* it will flow on into *c,* and *d,* and so on, following the line of least resistance formed by the connection or *association* of the traces. Thus A raises *b, c, d,* (the ideas of B, C, D), by force of *contiguous association.*

Its use in the economy of mind—it integrates sensations into ideas.

And it is by this integration in thought that, from fleeting and discrete sensations, the mind is able to form complex ideas of things, which it can retain and carry about with it and revive when wanted; and that order and connection are introduced into thought, corresponding to the order and connection of qualities and things in nature.

Thus, when a fruit is put into the hand of a child, it experiences sensations of touch, colour, taste, smell, etc. But these experiences are really separate and independent of each other, being experienced through different senses and nerves; and if they remained unconnected in thought, the child could form no idea of the fruit. But from the fact of their being experienced contiguously, the traces which they leave become connected in such a way that one cannot be revived in thought without reviving the others; so that the colour, touch, taste, and smell, come to coalesce together into one complex idea, corresponding to the complex structure of the thing and its qualities in nature.

But it is clear that reintegration by contiguity will go on in two ways—both

(1) *Automatically*—for when experiences have occurred several or many times together, their traces of themselves coalesce in such a way that they cohere, and may even become altogether *inseparable* in idea, (which is called *inseparable association*)—and

(2) *Voluntarily*—for by fixing the attention upon two or more things, and endeavouring to grasp them

together in one *whole of thought* by effort of synthetic attention, we promote the connecting of their traces in brain and mind, and thereby their integration in memory.

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CHAP. XII.

§ 86. Now there are two forms of connection by contiguity.—Things and qualities of things co-exist *contiguously in space*, and may be experienced simultaneously, and thereby associated in *order of co-existence*; events follow each other *contiguously in time*, and may be experienced successively, and thereby associated in *order of succession*. The one form of contiguous association builds up our ideas of things and qualities of things composing the world around us; the other form strings together our ideas of the events of life and history. Thus

Association of co-existent things and qualities, and of successive events.

(i) As to our ideas of the *concrete things co-existing around us in space*.—Every concrete thing has different qualities and parts, connected in different ways, and each of these requires a different act of perception, through a different sensation; and our idea of the thing as a concrete whole has to be formed by associating together, according to this law, the results of these many different perceptions.

Ideas of things.

Thus, in the case of the fruit, we perceive that it is a yellow thing, a soft thing, a round thing, a sweet thing, a thing composed of rind, pulp, seeds, and so on; and when we have experienced these perceptions often together, or in close succession, the predicates, yellow, soft, sweet etc. become associated *contiguously*, and thereby integrated in thought into one idea of a round, yellow, soft, sweet object, with the accompanying cognition that such an object exists. And no one of these qualities can be brought before the mind again, whether in sensation or idea, without its completing itself by overflowing into, and reviving the rest in one whole of representation. Thus even the *perception* of a thing, we have found, is never complete until the *present* sensation, giving one quality, has revived in *representation* the other sensations giving the other qualities (the *representative* element in perception).

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And as we form our ideas of concrete things by associating together the qualities given in sensation, so we form our ideas of aggregates, such as houses, towns, countries, and the world as a whole, by associating together the ideas of many concrete things in the order given in experience.

Ideas of
events.

(ii) As to our ideas of *events succeeding each other in time*.—The fundamental synthesis of this kind is, of course, the series of experiences constituting our own life, for hours, days, and years; while according to the analogy of our own, we represent the experiences and life-histories of others. The mental activity passes continuously from one experience to its successor, and connects them into a subconscious series corresponding to the original one; and revives them in the same order, in trains of successive ideas. And when things are always experienced in one order of succession and no other, their association in that order may become so rigid that we are unable even to think of them in the opposite order, *e.g.* the letters of the alphabet.

Trains of
ideas, simple
and complex.

Thus, by association of successive experiences, *trains of ideas* are formed. A train of ideas formed from sensations of the same sense will be a *simple train*; and as many simple trains will be possible as there are different sensations. Thus the ticking of a clock, the drifting of the clouds, give simple trains of sounds and sights. But most trains are *complex*, *i.e.* composed of two or more simple trains (given by different senses) running parallel to each other, and associated collaterally as well as successively. Thus in the case of language, *e.g.* in remembering a poem or any other composition, we remember (i) the sounds of the words as a train of auditory ideas, associated successively, and (ii) their articulations (movements of throat, tongue, lips, etc. in pronunciation) as a muscular train, also successive; while at the same time the sounds of the syllables are associated collaterally with their own articulations, so that there is here a double train of ideas, auditory and muscular. But (iii) if we take into account the train of mental

images or thoughts which accompany the words, we find that the train is really triple. And if we add the writing of them, then there will be (iv) the train of visual symbols, and (v) the train of muscular feelings of the hand in writing. Thus in writing from memory there will be a complex train of five distinct lines of idea, associated both successively and collaterally.

§ 87. II. The *Law of Suggestion by Similarity, or attraction of similars*,—is that a present percept or idea of a thing has a tendency to suggest, and revive in idea, any other thing or things which have been previously experienced resembling it—or simply, that like suggests like.

For similarity between two things means that the sensations which the two things give are partly identical and partly different. Now in so far as they are identical, the traces which they leave in the system will *coincide*, each strengthening the other. But the identical elements will be associated *contiguously* with the differing ones, having been experienced simultaneously. Hence, when a new percept occurs resembling a former one, the common elements in the new one flow into the traces left by the corresponding elements in the old one, and revive them; and these revive the differing elements of the old percept by contiguous connection. Thus the similarity of the new experience to the old one leads to the revival of the old one in idea.

Thus, suppose a former percept ABC, leaving traces *abc*, which will be connected by contiguous association. Then, if a similar experience occurs, *e. g.* ABD, the common sensations AB, strike into the track of their former selves, *viz.* into the traces *ab*, and reinforce and revive them; and these revive *c* by contiguous connection. Thus ABD revives its similar, ABC, in idea.

It is evident from this however, that revival by similarity contains an element of contiguous suggestion also, because it is only by collateral association that the identical elements, when revived, can revive the disparate ones, and thus bring up the whole concrete image.

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But there are two kinds or degrees of revival by similarity, which may be distinguished as *recognition*, and *comparison*, and which shade into each other gradually—the former being a mainly *automatic* process, and the latter a *purposive* one. Thus—

Recognition.

1. At one end of the scale there is *revival with more or less amalgamation of the revived idea with the present percept*, giving the feeling that the thing has been experienced before; but without raising any separate image of the thing as formerly 'experienced'. This is called *recognition*. Thus when a new percept, $A_2 B_2 C_2$, is very nearly identical with a former one $A_1 B_1 C_1$, (collaterally associated elements being of no importance); then what the new percept, $A_2 B_2 C_2$, does, is simply to strike into, revive, and amalgamate into itself, the revived vestiges of the old $a_1 b_1 c_1$, thereby strengthening itself, and giving the feeling and conviction that this percept is not new, but a repetition of one that has been experienced before, *i. e.* a feeling of *recognition*. But it does not bring up along side of itself any distinct image of the former percept, having amalgamated it into itself. There is no *separate* image *a b c*.

Comparison.

Thus, when we read a poem which we have read before, we recognize it as known to us before; but it does not revive any distinct ideas of our former readings. When we meet a friend on the street, the percept of him gives us the conviction that we have often experienced it before, but does not usually bring up any distinct image of former percepts of him. But if he is very much changed, as by illness, then the difference may affect us as much as the identity, and bring up a more or less distinct image of him as we saw him before, making us compare his present appearance with his past. In this case, there is not only *recognition* but *comparison*.

2. At the other end of the scale there is *revival without amalgamation*, *i. e.* the present percept brings

up the past one resembling it, as a *distinct image alongside of itself*; so that there is *explicit assimilation* of the one to the other, *i. e. comparison* between the two, and cognition of their similarity. This happens especially when the difference combined with the identity is considerable. The differing elements prevent the amalgamation, and keep the revived image distinct from the reviving percept. AB revives *ac* as a separate image alongside of itself.

Thus the sight of a person may revive, by force of similarity, a separate image of his brother, or father. The sight of a peculiar plant raises in the mind of a botanist the image of some other plant of the same order, and makes him compare them in his mind, and consider whether they are of the same species or not.

But revival with distinct images is much less common and less important than amalgamative revival, and has usually some other motive force than that of mere similarity, *vis.* some special, practical reason for comparison. Thus the sight of an usual variety of rose makes one revive distinct images of other roses like it, in order to satisfy his curiosity as to whether it is a new variety or not.

§ 88. The first of the above forms of assimilation, *vis.* automatic assimilation and recognition, is a force of the greatest importance in the acquisition of new knowledge. Our first acquirements have to be by contiguity mainly. But contiguity is an *external, artificial* bond of connection, which requires to be established by *laborious repetition*, as in learning the multiplication table; and without continual repetition proves evanescent, as in the case of learning by rote, and "cramming." As progress is made, however, the understanding begins to find that the new steps are more and more *like* the old ones; that the higher stages of every study are merely repetitions and modifications of the lower; that the fundamental and simpler repeat themselves in the higher and more complex; and thus similarity

The use of
assimilation
in the economy of
mind.

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comes in to supplement and reinforce the weaker force of contiguity, and lessen the labour of remembering. We recognize the old repeated in the new. For similarity is a natural and essential connection, contained in the nature of the things themselves, and does not require to be created by any labour of ours, but operates spontaneously.

Its uses in
acquisition.

This is well seen in the learning of languages. When one has mastered the parent language of a family, the rest are rendered easy by similarity. Thus the acquisition of Latin and Sanskrit makes it easy to acquire the rest of the Romance and Sanskritic groups, because their fundamental forms are found to be identical. Learning comes to consist largely in recognition.

In the logical
processes.

Assimilation, indeed, in more or less amalgamative forms, *i. e.* as recognition, is the basis and essential factor of *abstraction*, *judgment* and *reasoning*—in fact, of all the higher functions of thought; because thought, as distinguished from sensation and perception, consists in penetrating beyond sensations and individual things, leaving them behind, and reaching to the fundamental common *essences*, *causes*, and *reasons* which underlie many things, in order to understand the world as a connected system. Thus—

Abstraction and *conception* consist in the wearing away, or abrasion, of the contiguously associated and disparate elements in ideas, leaving the *common and essential ones*, the traces of which coincide; and these form our *concepts* or *class ideas*, (each summing up a whole class of individual things in *one general idea*), and constitute the materials of scientific thought—

Judgment consists normally in discerning that a thing partly new and strange to us possesses some attribute or predicate in common with other things already familiar to us, thereby assimilating and classifying the thing, and assigning it to its proper place in our system of ideas—

Reasoning, again, is the reaching out from classes of things already known, to other things not hitherto known, in virtue of some identity and community of essence, cause, or reason—implying the same power of identifying, assimilating, and amalgamating the individual with the general by similarity.

Thus all the logical processes consist in taking advantage of, and applying the similarities and identities underlying things, so as to simplify thought, and extend its range.

§ 89. Finally, if we compare the above two processes of suggestion and memory, *viz.* by means of contiguous association and similarity, we find that they are not entirely distinct, but that each contains an element of the other—that revival by contiguity contains an element of assimilation, and revival by similarity an element of collateral suggestion:—

(a) Thus, in the case of *contiguity* when A revives B by contiguous association, it is because A and B have been connected together in one whole of experience, *viz.* AB, and have left connected traces of themselves in the system, *viz.* *a b*. How then does A, when it recurs in experience, revive B? It is because the activity of A flows into, and revives first the vestige of its own former self, *viz.* *a*, by automatic *assimilation*, and absorbs it into itself; while the activity of *a* in reviving overflows into *b*, and revives it also, but by *contiguous* connection. Hence, though *a* is absorbed into A, *b* is raised as a distinct image alongside of A. The revival of *a* is not noticed because it is amalgamated in A.

(b) Again in *assimilation*, when AX raises its similar AY in idea, it is because A has been contiguously associated with Y in previous experience; so that, while A raises *a* by coincidence of vestiges, *a* raises *y* along with it by *contiguous* connection; and thus, by the two processes operating together, AX revives its similar, *ay*. The reason why *a* is not in this case absorbed wholly into A, is that the contiguous force and importance of *y* keeps it distinct. Thus when suggestion by similarity really gives a distinct image of the suggested thing, it is the force of contiguity that keeps it distinct—the attraction of *y* and *a* for each other.

In each case, however, the assimilative precedes the contiguous revival; so that, thus far, similarity may be said to be the more fundamental of the two.

§ 90 III. The *Law of Suggestion by Contrast or Opposition*—that *percepts and ideas have a tendency to suggest*

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Contiguity involves an element of similarity, and similarity, of contiguity.

The Law of Contrast.

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other ideas strongly contrasted with them, and especially their contraries or opposites.

This is essentially a logical principle, or necessary condition of thinking, arising out of the *law of relativity*—that consciousness is impossible without difference, contrast, and opposition of materials (p. 74). For the intellectual factor of consciousness resolves itself, we have found, in the last analysis, into the two correlative functions of *discrimination* and *assimilation*, or the discerning of differences and similarities; and if similarity be a reviving force, then contrast and opposition must be one also. Hence:—

Unavoidable
in the case
of correlative
ideas.

1. There are many things which we cannot think at all without contrasting them with their opposite and correlative ideas, so that in order to be thought at all, they must bring up their correlatives along with them, e. g. north and south, right and left, hot and cold, good, and bad, cause and effect, substance and quality, relative and absolute, finite and infinite, mind and matter. Such ideas necessarily revive their correlatives along with themselves, because without them they would not be ideas at all.

But even this *correlativity* of fundamental ideas has something in common, it will be seen, with the principle of contiguity considered as the *redintegration* of wholes; because two correlative ideas such as north and south, finite and infinite, are, in a sense, only correlative constituents of one complex idea.

And neces-
sary to dis-
crimination.

2. And even where there is no such explicit opposition or correlation, contrast is still essential to consciousness, and the contrasted elements have generally to be filled in by memory. In some cases, to be sure, they are supplied directly by sensation, as we distinguish the red flower on the tree by its contrast with the green of the leaves. But in thinking of the flower afterwards, the contrasting elements have to be filled in by suggestion

I cannot picture the red colour of the flower in idea, without filling in green, blue or yellow as a contrast. Hence, the necessity of contrast is evidently a reviving force, as well as contiguity.

It may be said that there is even an element of similarity also, combined with contrast. For discrimination of differences is always accompanied by discerning of agreements. Contrasted things are always things of the same kind. Things wholly incommensurable cannot be contrasted. We do not contrast *vice* with a sour smell, but with *virtue*, because, though opposite, they are commensurable in being both forms of voluntary conduct and character. Thus even contrast supposes that the contrasted things have a basis of similarity.

Some writers are inclined to depreciate the law of contrast, as not being an independent principle of association—involving as it does both contiguity and similarity. It is true that it is not, strictly speaking, a *principle of association*, (for that term applies strictly only to contiguity). But it is, we can see from the above considerations, a distinct *principle of suggestion and memory*, as much as the others. For each of the three involves the others to some extent.

§ 91. But suggestive forces do not always operate singly. Several may combine into one complex force, *converging*, so to speak, upon a single idea, and raising it into consciousness by their combined force. And on the other hand, two or more such forces may tend to obstruct and eliminate each other, and hinder the revival of an idea. Such combinations of suggestive forces, helping or conflicting with each other, are spoken of as *complex associations*; and will include the two kinds of *convergent* or *cumulative*, and *divergent* or *obstructive*.

1. *Convergent association* is when the suggestive forces of several percepts or ideas converge upon, and co-operate in the raising of an idea. Thus, suppose that A, B, and C have been associated, whether simultaneously or at different times, with X. Now if A be experienced again by itself, its force may be insufficient to revive *x*;

Complex
suggestive
forces.

Cumulative.

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and the same may be true of B and C, acting separately. Yet if A, B and C be, by any means, brought before the mind together, their combined forces, converging on x , may be sufficient to revive it.

Thus, when we want to remember something which will not come up of itself, we think over all the other things which we know to have been connected with it in some way, in experience or by similarity, and find perhaps that their united force can do what none of them could do separately.

And there may also be convergent *trains* of associated ideas. Thus A may lead to b , b to c , and c to x ; and again L may lead to m , m to n , and n to x . Then A and L may combine to raise x , through their respective trains.

And obstructive.

2. *Divergent or Obstructive Association*, again, is when the suggestive tendency of one percept or idea tends to draw away the mind from, and obstruct the suggestive force of another. Thus A may be associated with b , and b with c , and so on in a train, and would of itself lead the thinking power along that train. But A may also be associated with l , and l with m , and so on in a different train. Then there will be a conflict as it were, between the force of A's association with b , and that of its association with l , because it cannot revive both trains at the same time. Suppose its association with l prove the stronger, then the thinking activity will flow along the line l, m, n, o : and the other train will be suppressed for the time being.

Thus we continually find ourselves entering upon, or engaged in a particular line of thought, when something breaks in upon us, and draws away our attention, and leads it along an entirely different line, driving the former from the field of consciousness for the time being (what we called distraction).

This apparent conflict between different lines of suggestion led Herbart to the opinion that subconscious ideas are *things* acting and reacting on each other, and contending for possession of the field of consciousness. § 82.

§ 92. Thus the forces of suggestion rising out of previous associations between ideas are the agencies by which the subconscious traces of past experiences are stimulated and raised into consciousness again, producing memory of the past. Psychologists, however, distinguish two kinds of memory according to the *relation of the suggestive forces to desire and will*.^{*} When the self remains *passive* without exercising any effort of will-power to direct the course of its thought, and allows its percepts and ideas to go on spontaneously suggesting and reviving other ideas according to their connections, then memory is said to be *passive*, *automatic*, or *involuntary*. When it interferes to direct the course of suggestion and revival by effort of will for some special desired end, then memory is said to be *voluntary*; and memory which is thus prompted and guided by volition is also called *recollection*. Hence—

1. In *passive* or *automatic memory* the self remains inactive, and leaves its percepts and ideas to go on suggesting other ideas, and these others, and so on, according to the strength of their connections, without any effort of will to direct the suggestive force in any special direction, to the revival of any specially desired idea—remembering without *trying* to remember.

Thus when we are tired and sit down to rest, we give up all mental *effort* for the time being, and leave our percepts and ideas to themselves; and the one which happens to come foremost begins a train of thought in which consciousness is carried along from one idea to another by the suggestive force of the ideas themselves. This involuntary form of memory is apt to be mixed up largely with involuntary *construction* or *imagination* proper, and then constitutes *reverie* or *fantasy*.

And not easily distinguishable from this automatic memory, are the cases of what are called *temporary* or *recurrent* images—images of recent experiences which have impressed themselves so deeply on the system

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Two ways of remembering.

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Trying to
remember.

that they spontaneously force themselves back again by their own elasticity, without requiring to be recalled by the suggestive force of other images. (§ 83)

2. *Voluntary memory, or recollection, is when the self definitely desires the revival of an idea or group of ideas for purposes of its own, and therefore, instead of remaining passive, applies effort of will to raise the ideas wanted, and remembers by trying to remember.* How then does volition operate so as to influence the forces of suggestion, and recover a lost idea which will not come back *spontaneously*, nor by *automatic suggestion*? It cannot act directly on an absent idea; it must use means to revive it; and the only possible means is the suggestive force of other ideas. The self, therefore, by effort of will, thinks out such ideas as must have been associated with the lost one, and by effort of will *concentrates its attention* upon these successively or all together, in the hope that by their individual or cumulative force (*simple or complex suggestion*) they may raise the lost idea. This *gathering together and combining* of suggestive forces by effort of will to recover a lost experience, is called *recollection or reminiscence*.

Thus suppose x to be an idea which will not come back by the automatic suggestion of other ideas, nor by its own spontaneity. Then by effort of will we search out things A, B, and C, which have been associated with x ; and intensify our ideas of them by concentrating our whole thinking power upon them, in the hope that when thus combined and intensified by attention, their suggestive force will be sufficient to overflow into, and revive the lost idea x .

Forgetting.

Forgetfulness would seem to arise partly (i) from "traces" of past experiences fading away; and (ii) partly from their losing their lines of connection with other traces, so that no suggestive force can reach them. "There seems to be a constant decay of all "our" ideas, even of those which are struck deepest; so "that if they be not renewed by repeated exercise of

"the senses, the print wears out, and at last there remains nothing to be seen. The ideas, as well as the children of our youth often die before us, and our minds represent to us those tombs to which we are approaching; where, though the brass and marble remain, yet the inscriptions are effaced by time, and the imagery moulders away" (Locke). Forgetfulness, however, is not wholly an evil; it relieves the mind of useless materials, and leaves room for more valuable acquisitions. Some have doubted whether there is such a thing as absolute forgetfulness. Lotze said that the more wonderful thing is, not how mind remembers, but how it forgets; seeing that its plasticity is so great. Certainly all experiences would seem to leave effects on the mental constitution as a whole; but these effects may be for the most part *collective* only, and not capable of being revived *individually*, though by their collective and aggregate effect they modify our intellectual and moral character.

Strange stories are told, however, not only of the sudden vanishing of great masses of acquisitions which seemed to be always at the command of memory, but also of the sudden revival of others which seemed to be irretrievably lost. Thus a person may have used a certain language in his childhood, but afterwards acquired and made exclusive use of another, and entirely forgotten the language of early life. Yet cases are recorded of the acquired language being suddenly forgotten, and that of infancy suddenly returning with full force. And connected with this are the strange phenomena of "multiple personality" already referred to (p. 84.) This apparent doubleness of life appears also in hypnotism and somnambulism. In the normal waking state a person remembers his past waking experiences as one series; but in the hypnotic state he remembers his past hypnotic experiences as another series; and thus seems to lead a double life.

These phenomena prove that the traces of past experiences often retain the distinctness of the original experiences, even when ordinary memory cannot recall them.

§ 93. What then, it may be asked, are the *general conditions of memory*—of the *reviving and recognising of past experiences in the form of distinct images?*

1. In the first place, memory depends upon *reten-*

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val.

General con-
ditions of re-
membering.

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in distinct
forms.

tion or conservation of the effects of past experiences.

Nothing can be revived which has not been in some way preserved. Now the retention of experiences in the form of distinct "traces" will depend partly—

(1) On the *force and vividness* of the original sensations and perceptions, which will depend again partly on the *intensity of the original stimulus*; but more especially perhaps—

(2) On the amount of *attention or concentration of the mental power* upon the successive percepts, and their meaning and connections. For the more clearly we grasp the thing with its connections and relations in perception, the deeper and better connected will be the effects or "traces" which they leave in the system, and the easier their reproduction. This use of attention is called *connective attention*, and is one of the ways in which will may affect memory—

(3) But *connective attention* itself will depend on the *interest which a thing excites in us*. We concentrate our attention upon it, and thereby fix it in our memory because it has some *interest* for us. And things interest us either because they excite in us some strong feeling, such as wonder, surprise, fear, delight, or are likely to be in some way useful to us in the future.

(4) And to these conditions has to be added *frequency of repetition*. When the same series of impressions are repeated again and again, the mere repetition tends to deepen their effects, and make revival easier, as in learning by rote. "The pictures drawn in our minds are laid in fading colours; and if not sometimes refreshed, vanish and disappear."

Of representation.

2. In the second place, memory depends on *the stimulation and revival of the "traces" left by past experiences, i. e.* it supposes *reproduction and representation* as well as retention. On what then does representation depend?

(1) It depends, partly of course, on *the depth and freshness* of the retained effects or traces. For a time, it seems, the impression retains some spontaneity and elasticity of its own, and tends to spring up again of itself; but after a time it seems to lose its spontaneity, and requires to be stimulated to renewed activity.

(2) Hence reproduction will depend mainly on *the stimulating force of suggestive percepts and ideas, and on associative lines of connection* to lead the mental activity from one percept or idea into the traces of other ideas, so as to revive them. And these depend, we have found, upon *contiguity in experience* (the more frequently the things are conjoined in experience, the deeper will their traces and connections be), or upon *similarity* or *contrast* in the nature of the things themselves.

XX. IMAGINATION.

§ 94. Memory or reproductive imagination consists, we have found, in raising representations of past experiences, and recognizing them as such; and the perfection of memory consists in representing them exactly as they were experienced, with the least possible modification or reconstruction. Thus so long as a mind limits itself to what it has seen, heard, etc, it employs memory only. But as soon as it begins to pass beyond the range of its past perceptions, then something more than memory is necessary.

Constructive
imagination.

Constructive imagination, on the other hand, supposes indeed materials supplied to it by memory of past experiences, but *consists in recombining and reconstructing these materials into images or representations of things and events which have never entered into our own experience at all.* They may or may not have entered into that of others. Thus in reading Roman history, or travels in central Africa, or in the Arctic regions. we are reconstructing, and representing in our minds, things which we have not ourselves experienced, though others have. In reading the geologist's description of the early ages of the earth, we are constructing scenes which have been experienced by no human being, but *might* have been, had human beings then existed. In read-

Of different
kinds.

ing the "Thousand and One Nights," or Scott's romances, we are constructing scenes which no one could have witnessed, because they never took place, and therefore indulging in pure fancy. In expectation, we are constructing scenes which we believe we shall ourselves experience in the future.

Thus the scenes which imagination constructs may (1) be referred to a particular time, and believed to represent approximately real things and events, as in historical and scientific reconstruction, and in expectation; or (2) be altogether independent of time and reality, as in pure fancy and romance. But whether they aim at representing reality, as in the former case, or merely at the pleasure of mental activity as in the latter, the process of construction itself is essentially the same.

Process of
construction
analysed.

§ 95. Hence the process of constructive imagination may be analysed into the following constituent factors:—

1. In the first place, construction supposes *materials out of which new images may be reconstructed*; for even mind cannot construct anything out of nothing. Whence then does it get materials for its constructions? They must be supplied by memory from the traces of actual past experiences.

Thus, if we try to form a conception of the falls of Niagara, which we have never seen, we must revive what we have seen and heard of running and falling waters, of spray, and mists, and rainbows, rocks and trees, and recombine these into new forms, to agree with the description which we have read.

2. We must also have some notion beforehand of *the kind of representation which we want*, and the purpose for which we want it—whether it be a new theory to explain some phenomenon of nature; or something for practical usefulness, such as the plan of a new building, a new engine, or new electrical apparatus: or something for æsthetic gratification merely, as a group of statuary, a picture, poem, or romance.

3. And we must put forth an *effort of conation* to construct the representation wanted. The effort will consist in concentrating the mental activity (attention) upon the materials supplied by memory, comparing them, and distinguishing those likely to serve our purpose, abstracting or separating these from the rest, and finally putting the selected materials together again into a new combination, to find whether, when thus reconstructed, they will serve our purpose.

If the first attempt is not successful, then its results will have to be set aside, and a new construction attempted; and so on until the end is attained.

But there are limits, of course, to the power of constructive imagination. It cannot construct anything out of nothing, and therefore supposes materials supplied to it, and these can be supplied only by memory of past experiences. Therefore every one's constructive power will be limited (*i*) by the range of his experiences, and (*ii*) by the power of his memory. Again things may have been so invariably connected in experience, and therefore so inseparably associated in idea, that no power of imagination can separate them so as to conceive the one without the other. Mill therefore points out that imagination is limited (*iii*) by this tendency to *inseparable* association; and uses this principle to explain our inability to conceive the opposites of those propositions which are called necessary truths.

§ 96. Imaginative constructions may be classified according to several different principles of division—according to *the way in which the constructive power operates*; according to *the sources from which it derives its material*; and according to *the end or purpose at which its aims*. Thus—

I. Construction, like memory, may operate in either of two ways—*automatically or voluntarily*.—

1. *Automatic, spontaneous, or involuntary* construction, is when the self remains passive, and ideas rise and draw together, and form themselves into new

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construction.

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ding mental
construc-
tions.

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operation.

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Involuntary
construction.

combinations, stimulated by, and in conformity with the predominant emotion of the moment, but *without any desire, intention or effort of will*, and sometimes in spite of, and to the extent of paralysing will. Sub-conscious forces working among the great mass of subconscious traces, and stimulated perhaps by conscious feelings stirring the obscure depths of the subconscious, form new combinations spontaneously, which gradually rise into the conscious sphere.

Such spontaneous constructions are seen in fear and panic which prompt the imaginative power to construct unreal and fantastic images of terror. The creations of superstition lay hold on the primitive mind with the force of realities. Hope, despondency, sympathy impart their own colouring to the mind's constructions. In *fantasy, reverie, day-dreaming*, consciousness flows on continuously, raising ideas of memory, and reconstructing them into more or less new forms, in harmony with the prevailing feeling. Original creative genius, both artistic and scientific, works to a large extent spontaneously. Not much can be accomplished by merely *trying*. New combinations flash upon the mind spontaneously, as if they came by inspiration. The poet, especially, is "born, not made." His constructions rise by native spontaneity.

Such involuntary construction mixes itself up largely also with memory, so that people think they remember what their minds have really constructed unconsciously.

Voluntary
construction.

2. *Voluntary and intentional construction*—is when we specially *desire* to form a conception of something which we have never ourselves met with in experience, and *try to construct such a conception by effort of will*. Thus the inventor perhaps always, and the poet generally, has a notion beforehand of the construction which he wants, and throws an effort of will into the work of constructing it. Thus, though little could be accomplished by merely willing without subconscious spontaneity, yet will guides the constructive forces towards the desired end. A poet will not produce a

great poem by merely *trying*, i.e. without spontaneous genius; but at the same time he will not produce a continuous and perfect work without effort of attention, reflection, and design.

How then does will operate in construction? It cannot act directly on what is not present to it. As in recollection, therefore, it must operate indirectly. Having some notion beforehand of what kind of construction we want, we understand what other things come nearest to it, and what materials are needed for its composition. Then by concentrating attention on these models and materials, the first indefinite notion of what is wanted gradually takes the form of a concrete image. Thus volition and spontaneity are usually combined more or less in construction.

Thus it would appear that an element of spontaneity is required even in so-called voluntary construction; and that great part of the work involved goes on subconsciously—only the results come to the surface.

Now, if spontaneous subconscious processes be of such importance in imagination—if so much of the work of mind is thus carried on subconsciously—the question comes back upon us, with regard to the nature of this subconscious work. Are the discoveries of science and the creations of poetry and romance simply chemical integrations and disintegrations of brain cells and fibres? Or is there such a thing as subconscious mind and ideation? It is difficult to avoid the latter conclusion. (§ 20 and § 86.)

§ 97. II. Another way of dividing mental constructions is according to *the way in which the mind obtains the materials for them, and the preliminary notion of the kind of construction wanted*. This principle of division gives the division of imagination into *receptive* and *creative*.

Receptive imagination—is when the guiding idea of the construction, the materials, and the mode of combining them are suggested from without. Such imagination, therefore, is not original, but is a constructing over again of what others have perceived or constructed for themselves, and therefore of what has already passed through the minds of others.

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note

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Thus in hearing or reading a description or narrative of things and events which we have not seen, we are constructing images of these things and events as we proceed, but the forms of the images and the materials for them are *suggested* to us by the words of the writer. And what is called vigour, picturesqueness, or power of style in a writer is his power of suggesting the images of his own mind to the mind of the reader by means of words, and helping him to picture with unusual vividness and clearness, scenes and events which he has never seen, *e. g.* Tennyson and Carlyle.

Creative
imaginative.

2. *Creative or original imagination*—is when the idea and its materials are not thus suggested from without, but mind supplies or evolves the guiding idea from within itself, and raises the materials from among the contents of its own memory, and puts them together according to its own creative impulse.

It is imagination of this higher kind that is required by the inventor who constructs a new combination of mechanical means to produce a desired effect; by the scientist and philosopher who constructs new hypotheses or theories to explain the hidden causes and reasons of things; and by the artist, musician, and poet, who produces new combinations of forms and colours, sounds and ideas, such as will gratify the sentiment of the beautiful.

Thus imagination, when rightly regulated, is conducive to the highest purposes of intellect. Yet it may be used in a way detrimental to intellect. People may surrender themselves so much to what they merely imagine, as finally to identify it with reality, and allow it to lead them away from truth; or to become indifferent to, and neglect the realities and duties of life, and live in empty dreams. And further, it is apt to mix itself up automatically with *memory*, and even with *perception* to some extent, so that we may think we perceive and remember what we merely imagine.

According to
end and use.

§ 98. III. Yet another way of dividing imaginative constructions is according to the ends or uses to which they are directed; and according to this principle there will be three divisions—(1) those which aim at helping

the mind to *understand things*, thereby satisfying the wants of the intellect; (2) those which aim at being of practical use; and (3) those which aim merely at gratifying the æsthetic sentiment, or sense of the beautiful—in other words, *intellectual, practical, and artistic* constructions. Hence:—

I. *Intellective or cognitive construction*—is imagination applied to intellectual purposes, *viz.* to constructing images and conceptions of things and causes of things, which will agree with reality, and enable us to understand things.

Construction for purposes of knowledge.

(1) Cognitive construction in a *receptive* form is exercised in “realizing” the descriptions of history and science, *i. e.* in forming images of the scenes and things described, in conformity with descriptions given. And realizing of descriptions involves what is called “concreting the abstract,” because the descriptions of history and science are often only broken and isolated facts, which have to be put together, filled up, and translated into concrete images by the mind.

Reproductive.

E. g. realizing the descriptions of the geologist and astronomer; the appearance of diseases from the *diagnoses* given of them in books; a species of animal or plant from its definition; realities beyond the reach of observation from their sensible results, as processes of brain, vibrations of ether and air, the structure of molecules and atoms, and so on.

(2) Cognitive construction in a *creative and original* form is exercised in the construction of theories or hypotheses which lead to scientific discovery. The causes of many things are not open to observation, and in order to discover what they *are*, it is necessary to begin by constructing some mental image or conception (called an *hypothesis*) of what they *may* be, and then seek to determine by calculation, or where that is not possible, by continuous observation and experiment, whether the hypothesis agrees with reality or not. If

Original.

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not, then it has to be set aside and another one constructed. When a hypothesis has been sufficiently confirmed, it ceases to be a hypothesis, and is regarded as a law of nature. Thus all scientific discoveries begin with efforts of *cognitive imagination*.

Thus the *emission* and *undulation* theories of light were both at first hypotheses. The former was at last rejected, and the latter confirmed. Newton's theory of gravitation, and Darwin's theory of evolution were efforts of creative scientific imagination.

Practical in-
vention.

2. *Practical construction or invention*—consists, in the application of imaginative power to the construction of mental images of things, which when realized objectively, will be of *practical use*, i. e. of use for supplying the physical wants and comforts of life. All mechanical inventions must begin with ideal constructions within the mind itself—the new implement or machine must be constructed in idea, before it can be realized in wood or iron.

The inventor must begin with a vague idea of what he wants; and reproduce in memory, from among those things which he has seen, those which come nearest to what he wants; and must alter and recombine in imagination, until he arrives at what he wants.

Construction
for purpose
of æsthetic
enjoyment.

3. *Æsthetic construction*—is the application of the constructive power to produce combinations of images and ideas which, either of themselves (as in poetry), or when realized in sensible materials (as in painting), will *gratify the sentiment of the beautiful*, or produce what is called *æsthetic gratification*. *Æsthetic constructions*, therefore, differ from *intellectual* ones in this, that they do not aim at extending our knowledge of things; and from *practical* ones in this, that they do not aim at supplying any of the physical wants of life. They aim at giving a special kind of gratification by themselves, and at being *valuable for their own sake*, and not as means towards anything else. They are

therefore called the fine arts, to distinguish them from the practical or industrial ones. What then are the fine arts ?

Architecture to some extent—for, though in so far as it aims at providing shelter merely it will be practical art, in so far as it aims at making buildings beautiful, it will be æsthetic.

Painting and sculpture may also be industrial in so far as they aim merely at preserving the likeness of persons, but they aim mainly at producing what is beautiful, and are thus far æsthetic.

Music is purely æsthetic, having no other object than to produce combinations of sound which will appeal to the sense of the beautiful.

Poetry also is essentially æsthetic, aiming at the beautiful in two forms—(1) at a beauty consisting in combinations of articulate sounds, appealing both to the ear and to the organs of pronunciation ; and (2) a beauty consisting in combinations of ideas, appealing to the intelligence. But as its principal materials are ideas, and ideas represent realities, poetry involves knowledge and insight into the nature of things, more than the other arts, and its constructions approach more nearly to intellectual ones.

Thus, at one end of the scale stands architecture, in which the practical motive predominates ; and at the other, poetry, which mingles more or less with the intellectual. Music is perhaps the most purely æsthetic.

§ 99. Something remains to be said about the *development of imagination* in the life of the individual.

1. As it supposes materials, which must be supplied by experiences, preserved and reproduced by memory, there can be little imagination in the child's life until he has undergone many experiences, and his memory has become well-stocked with images of things.

2. As soon memory has developed sufficiently to supply materials, then imagination becomes very active, and is indeed the predominant mental faculty for several years of life, as is manifested in play, in hearing and reading stories, fairy tales, adventures, and the like.

3. But in course of time, the reasoning powers

The fine arts.

Development of imaginative power.

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begin to develop, and with them, the sense of reality, desire to know what is real, and dissatisfaction with mere play of fancy. One begins to feel more and more the practical necessities of life, and this draws the attention more and more towards real things, and away from the creations of imagination, except in so far as they may be subservient to knowledge and practical purposes.

4. Later in life however imagination re-appears, with restricted limits, and in more refined form, as *æsthetic taste*, or appréciation of art and poetry, which takes the place of the more exuberant and playful fancy of the child.

PART VI.

ELABORATION.

XXI. LOGICAL THOUGHT.

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Different uses
of the word
thought.

§ 100. The elementary functions of mind are commonly regarded as three in number *viz. feeling, thinking and willing*. In this formula, and also in common usage, the word *Thought* is used in a wide sense to include all the intellectual operations of the mind, *i.e.* all the processes involved in the acquisition and elaboration of knowledge, from elementary *discrimination* of the different elements of sensation, up through *perception, memory, imagination, judgment and conception*, to the completion of knowledge by means of *reasoning*. All these processes are included under *Thought* in the common use of the term.

But these successive steps in the elaboration of knowledge can be seen to include two clearly distinguishable stages—

(a) *Concrete thought*—those processes which deal with things as they are or have been presented to us directly in experience, and give what is called *immediate* or *intuitive* knowledge; which is, at the same time, knowledge of individual, concrete things as given directly by *perception*, preserved and reproduced by *memory*, and modified and reconstructed by *imagination*.

Concrete.

(b) *Abstract, general, scientific thought*—these processes which extend our knowledge beyond our actual experience, and reach out to past, distant, and future things and events, thereby approximating more and more towards a knowledge of the world as a whole. But in thus extending the range of its thought

Abstract.

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beyond the range of actual experience, mind has to penetrate deeper than concrete individual things, and grasp at what is *fundamental, essential* and *general* in things; because it is only the essences or essential qualities that are common to the things which we have experienced, and past, distant and future things which we have not experienced, and thereby enable the mind to reason outwards from the former to the latter, from the known to the unknown. This stage, therefore, will include the processes of *abstraction, conception, generalization, and reasoning*.

The logical
processes.

Now the word *thought* in logic and psychology is commonly limited to the latter stage of *abstract* and *general* thought. And it may be said, therefore, to consist in that double process of elaboration which includes (i) *abstraction, conception, generalization*, or the process of penetrating beyond the separate individual concrete objects which are presented in perception and *represented* by memory, and grasping at what is *essential, general* and *common* to whole classes of things, and thereby forming *concepts, i. e. general or class-ideas*; and (ii) *reasoning*, or the process of using *concepts* or *class-essences* as means of reaching out from things thus given in our own experience, to past, distant, and future things—thus extending the range of knowledge beyond that of actual experience. And these processes of conception and reasoning are all applications of the fundamental intellectual functions of *discrimination* and *assimilation, differentiation* and *integration, analysis* and *synthesis*, which are combined in the *judgment* (which may be considered the *elementary unit of thought*, because the concept is a result of many judgments, and reasoning is a combination of judgments leading to the formation of a new one.)

Hence it is necessary to treat abstract thought under three heads—*Judgment, Conception, Reasoning*, (the word *Generalization* being used sometimes for the forming of concepts or general ideas, and therefore as equivalent to *Conception*; and sometimes for the drawing of general conclusions, and therefore as equivalent to *Inductive Reasoning*). Judgment, however, is common to both concrete and abstract thought, forming the connecting link between them.

Judgment.

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Judgment as
synthesis of
previously
discriminated
elements to
form ideas.

§ 101. Is the elementary act of cognition and synthesis by which elements given at first in different acts of perception are put together in thought, so as to form complex ideas and systems of ideas corresponding to things and systems of things existing independently of thought.

It therefore supposes as its conditions two terms clearly *discriminated* from each other, *viz.*, things or attributes of things given separately in present or former perceptions; and consists in a two-fold act of *cognition* and *synthesis*, *viz.* *cognition* that the two terms are connected with each other in nature so as to constitute a whole (in some sense), and mental *synthesis* of the two terms in idea into one whole of thought, believed to correspond to the objective whole. When thus put together by act of judgment, the elements become *contiguously associated together* by the concentration of connective attention upon them; and in this way our ideas of complex things and systems of things are formed by successive acts of judgment.

If they were experienced simultaneously in one and the same act of perception, they would be associated *automatically*, without requiring any conscious synthesis of judgment; but in most cases the parts and qualities of things are perceived separately, perhaps by different senses, and at different times and places; and require acts of judgment to put them together into complex ideas.

Judgment is therefore the process by which ideas are constructed, by putting together the elements given separately in perception and preserved by memory. The process of cognition, however, which is here given as the ground of the judgment, will be found to be identical with either *perception* or *inference*. The judgment strictly so-called therefore consists in the act of mental *synthesis* by which the different terms are put together into one idea, with the *belief* that this connection in idea corresponds to their real connection in nature.

It supposes, therefore, an antecedent *analysis* or *differentiation* of the materials of consciousness into different

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sensations, capable of being interpreted by perception as corresponding to different things, and consists in *integrating or putting these things and attributes and relations of things together in idea, in connections and relations corresponding to those of nature*, so as to form conceptions or complex ideas corresponding to the combinations of things and qualities in nature.

Subject and
predicate.

Of the two principal terms which enter into a judgment, the subject is the something in which we are directly interested, and of which we wish to obtain a fuller and clearer idea. We can do this only by adding on more attributes or predicates to the subject idea, to define it more clearly. And every successive judgment that we can pronounce upon it makes it more definite by incorporating with it a new predicate.

Ideas built up
by successive
judgments.

Thus when we say "this is an orange", we have on the one hand the round yellow something given in the present perception (the "this"); and on the other hand, the idea of a round, yellow, sweet object, of such and such size, structure and name; and in the judgment we combine this latter idea with the simple percept of the yellow thing, into one whole of conception, and thereby identify it as an orange. The idea of orange itself, again, here used as predicate, is the result of many previous separate perceptions, combined by different acts of judgment.

And when we say "Napoleon was made first consul of the French republic", we have on the one hand the idea of a person called Napoleon, and on the other hand the ideas of a country called France, and of the office of consul at a particular period of French history; and the act of judgment consists in joining the latter set of ideas to the former idea, and forming them into the one more complex idea of Napoleon as consul. And the ideas thus conjoined in this judgment into a more complex conception, are themselves already comparatively complex, being products of many previous judgments.

§ 102. We can see now that all thinking proceeds by means of successive judgments, and that judgment con-

sists in an application of the two correlative intellectual functions *analysis* and *synthesis*—supplemented by *association*.

(a) Thus we can see that all thought begins with *analysis* or *discrimination of differences*, as implied in the *law of relativity*.—There is no consciousness, we have found, without change, and consciousness becomes fuller and clearer in proportion to the number of differences discriminated. The lowest forms of consciousness, there is reason to believe, *e. g.* those of the infant, or of the lower animals, are comparatively homogeneous and vague, containing little more than a vague difference of pleasurable and painfulness. First probably, the sensations of the different senses begin to be discriminated, and different sensations of the same sense. And when understanding develops, these are interpreted as indicating different things and qualities of things. And we know that, to understand a thing, it is necessary to discriminate its parts and qualities—to understand the fruit, we must distinguish its colour, taste, smell, shape and touch, its rind, segments, seeds, etc. And in every act of perception a particular sensation is discriminated from the rest of the field of consciousness, and interpreted as manifesting a particular quality of a thing.

But these parts, qualities and relations which constitute the thing are given by distinct acts of perception, at different times and places; and in order that we may have complete and adequate ideas of things, these different qualities and parts must be integrated together into one complex idea, corresponding to the thing. Hence therefore—

(b) It supposes, also *synthesis*, or *integration* again of the discriminated parts and qualities, according to what is discerned to be their order and connection in nature; and each successive act of integration or *synthesis* is judgment. Thus, "this thing is yellow" is a

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Judgment
supposes dif-
ferentiation,
but consists
essentially in
synthesis.

Discrimina-
tion involved.

Integration
involved.

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judgment, integrating, as the result of a perception, the attribute "yellow" with the notion of "this thing." This yellow thing is round, this round yellow thing is soft, sweet, and so on, are successive judgments, adding on (as results of new perceptions) new predicates to the subject thing, until our conception of it is as complete as it can be made. And having once been put together as parts of one thing or whole by the judging understanding, these predicates coalesce together by contiguous association, and are remembered together as one whole of thought,

Understanding.

For to understand or have an adequate idea of a thing, it would be necessary to disintegrate or take the thing asunder into all its constituent parts (*e. g.* a steam-engine into all its wheels and tubes, a plant into all its fibres, vessels, and protoplasmic cells), and put them together again—in idea at least, if not with hand. Hence the movement of thought in judgment, the alternate *discrimination* and *synthesis*, corresponds to the correlative *differentiation* and *integration* which goes on in nature.

Thus judgment, and therefore all thought of which judgment is the ultimate unit, involves these two correlative processes of *analysis*, *i. e.* of discriminating and separating in consciousness the different things, and parts and qualities of things, and of *synthesis*, *i. e.* of putting them together again, according to their connection in nature. And of these two, the judgment proper may be said to consist in the act of synthesis or integration, and the analysis or discrimination to be the antecedent condition implied in it.

Ultimate notions supposed in understanding—the categories of judgment.

But if judgment is thus the connecting together of two ideas, so as to constitute one more complex idea, there must be in the mind beforehand a *notion of something in respect of which they are connected or related*, and which is always in the background of the mind, forming the connecting link between the two ideas. Thus when we say "London is in England," we must have in the background of our mind the notion of space, as that in respect of which the two ideas are connected. Now the fundamental notions which form the backgrounds, or bonds of connection between subjects and predicates in thought,—the fundamental aspects under which things

may be regarded—have been called the *categories* of judgment (*predicaments* or *predicables*, in somewhat different senses). Aristotle gave ten; the predicate is connected with the subject as expressing its *substance*, *quantity*, *quality*, *relation* to other things, its *acting* or being *acted on*, its *place*, *time*, *position* and *condition*; but these, Mill points out, are neither mutually exclusive nor exhaustive. The principal links of connection are evidently the notions of *whole and part*, *substance* and *attribute*, *cause* and *effect*, and *position in place and time*. These will be considered in another place

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§ 103. Another question is the *ground of judgment*. We have found that judgment involves two processes, *vis. cognition* and an act of *synthesis*. But we have found that the *synthesis* is the judgment strictly so-called, and that the cognition is properly the ground on which the judgment is based, *i.e. the reason which we have for integrating the predicate term into one idea with the subject term, and believing that the corresponding things and qualities are so connected in nature*.

The grounds
of judgment.

Now there are ultimately two grounds of judgment or predication, *vis. perception* and *inference*. Some have added a third, *vis. testimony*, but that is rather a combination of the former two. Thus—

(a) Some judgments are grounded on *acts of direct perception*, and are called *immediate, intuitive, perceptual* knowledge, as when we say 'this rose is red,' or 'that is the time-gun.' But in mature life, as there are no simple perceptions, so there are no absolutely simple judgments. As each act of perception sums up and repeats in itself many previous acts, so every judgment really supposes many previous ones; because the subject term at least, to which the predicate idea is added on, is hardly ever simple, but is already a more or less compound conception, which has been formed by many previous conceptions and judgments.

Perception.

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Thus when we say 'that rose is red,' we already have a conception of what a rose is, and this conception is the product or result of many previous judgments, associated contiguously into one complex idea. Or both subject and predicate may be complex, as when we say "most judges of the High Court begin life as barristers."—where the ideas, "judge of the High Court" and "beginning life as a barrister," are both already complicate ideas, made up of many separate experiences, integrated by many separate judgments.

Inference.

(*b*) Other judgments are based on *inferences*, and are called *mediate* or *inferential knowledge*, as when we say "all the angles in a semi-circle are right angles," "there will be cool weather in December," "the next earth-quake will cause that building to fall." Such truths cannot be directly perceived. They must be inferred from other facts which *have* been perceived. Their terms are beyond the reach of direct perception. Ideas already formed by previous judgments have to be made the stepping-stones to a new idea, or rather modification of idea, by a new judgment.

Thus when we have perceived at different times that A_1, A_2, A_3 , etc. have been severally connected with b , we may conclude from these facts of perception that A is *always* connected with b , thereby combining A and b permanently into one complex conception ab , which is going (by induction) far beyond the range of actual past experience. And if we find further by perception that b is connected in some way with x , then we may go further and reason (deductively) that because A is b , and b is x , therefore A is x also, thus forming the still more complex combination abx . These are cases of reaching new judgments and ideas *mediately*, or through the medium of premises.

Testimony.

Testimony, also has been referred to as a ground of judgment, because the greater part of every one's knowledge consists of what he has heard from others, or has read in books, so that he believes it on testimony. But it is really a combination of the other

two. We believe what a witness says, because we infer from what we know of his circumstances, character and purpose that his statements must be true. And when a writer reports, not what he has himself witnessed, but what he has received from others, while they again received it from others (as in the case of Livy and his Roman history), the question of the credibility of the narrative becomes a matter of complicated inferences.

But if judgment be thus the joining together of ideas to form more complicated ideas and systems of ideas, then the combinations of the imagination also, it may be said, will be judgment; and we shall have to make a distinction between judgments of fact and judgments of imagination. (The difference will be that the former are known to be founded on grounds of *perception* and *inference*, and felt to be forced upon us by reasons independent of our own will, and therefore accompanied by the state of mind called *belief*, or the feeling and conviction of *truth*; whereas judgments of imagination will be felt to be of our own making, and therefore not accompanied by feeling of belief—unless it be in those abnormal cases where imagination overpowers understanding, and produces delusion.

The question of the nature of judgment, therefore, is closely connected with that of the nature of *belief* and *truth*, which will be dealt with in the next chapter XXII.

Conception.

§ 104. (Is the term commonly used for the process of forming *concepts* or *general ideas*, i.e. those more or less *abstract* ideas which are present to the mind when we think of *classes* of things, and which we fix in our own mind, and communicate to other minds, by associating them with *general terms*.) And it may be extended a step further to include also the formation of those more purely *abstract* ideas which are thought without reference to any class of concrete things, such as *virtue*, *gravitation*, *magnanimity*, *justice*

Belief and judgment.

Generalization and abstraction.

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The concept
and abstract
idea.

What it is.

or cannot be embodied in any concrete images whatever, such as *infinite* and *absolute*.

Thus the *general idea* or *concept* proper, though more or less abstract, always retains its ~~reference to concrete things~~, and suggests the class of concrete individual things of which it may be said to be an abbreviation, *e.g. horse, tree, mineral, planet*—words which generally suggest along with the general idea itself some more or less concrete ideas of particular *horses*, etc. while in purely *abstract ideas* the abstraction of the idea from concrete things is carried a stage further, and all reference to particular things disappears, as *e.g. the idea virtue or justice* may be thought without thinking of any particular just or virtuous person.

The *concept* or *general idea*, then, may be said to be the attempt to think what is *essential* (and therefore *general* and *common*) to a whole *class* or *kind*, and distinguishes that kind from other kinds, omitting as far as possible those non-essential characteristics which distinguish only the different individuals of the kind. Or it may be said to be an idea in which many different individual ideas, representing things of the same class or kind, are fused together in thought into one idea; which is done by elimination of those attributes which are limited to different individuals, and concentration of attention upon the essential ones which are common to all the individuals of the kind, and distinguish them from other kinds.

Thus when we hear such words as *palm, elephant, human being*, we can at once understand what is meant, without the time and labour of forming, whether from memory or imagination, any concrete image of any particular palm, elephant, etc. This implies that we have learnt to conceive and understand the *essences*, and form thereby *concepts* or *general ideas* of the classes palm, etc. so that we can think the *kinds* without the labour of picturing the *individuals*.

We say that the concept is an *attempt to represent* the essence of the class, because the concept is a more or less *abstract* idea, and abstract ideas cannot be pictured in thought as concrete images can. We cannot form any concrete image of a tree or horse having all the essential characters of the kind, but without any of those peculiar to individuals. Thus the thinking of the concept is an effort which is never completely successful, but sufficiently so for the purposes of understanding.

§ 105. We can now understand *the use and function of conception* as a phase of thought-elaboration.

Use of conception in the economy of mind.

1. In the first place, it *makes thought possible by abbreviating the work required of it*. Experience gives an inexhaustible plurality of individual concrete things which it would be impossible for any finite mind to retain and reproduce; so that if it were necessary for understanding that they should be retained and represented individually, thought would be impossible. But it is made possible in this way, that we can reduce the multiplicity of individual ideas which no mind could retain as distinct ideas, to a moderate and manageable number of *concepts* or *general ideas*, and can thus think in terms of *essences* and *class ideas* from which individuals have been eliminated.

It abbreviates thought.

This is the result of *conception*, which consists in concentrating thought upon what is essential and therefore common to all the individuals of a kind, abstracting this common element from the individuals themselves, and *thinking of classes in terms of their common essences*, eliminating the individuals. And this power of conception, or of forming, and thinking in terms of more or less abstract concepts, is an essential attribute of reason, and one of the characteristics which distinguish the human mind from that of animals, and the more highly developed intellects from the lower ones.

2. Again, it *generalizes thought*, and enables it to extend from the present to the past, distant and future—in other words, *it makes inference possible*. In perceiving, remembering, imagining, the mind is engaged with

It generalizes thought.

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particular individual things, existing at particular times and places. But when thinking in terms of concepts, it is engaged, not with particular things, but with *universals*, i. e. with *essences*, common to all individuals of the same kind, past, present, and future. And what enables us to reason from the present to the past and future is this *community of essence* between present past and future things—their class-ideas; so that concepts form the middle terms at least in all reasonings.

Finally, it enables us to *organize and unify* our ideas of things by *classifying* them in a hierarchy of higher and lower concepts or class-ideas, thereby reducing the multiplicity of things to the order, connection, and unity which is essential to understanding. In other words, *conception* is the basis of classification, and thereby of inference.

The process
analysed.

§ 106. We have next to consider *the process of abstraction and generalization by which concepts or general ideas are formed*. There is no doubt that in ordinary thought the process goes on to a great extent *automatically* and *spontaneously*—as a natural law and necessity of thought, having no need to be prompted and guided by effort of will. But in scientific thought the process becomes more and more *deliberate, intentional* and *voluntary*, so that the factors of the process, which were at first implicit and subconscious, become explicit and distinct. Hence we have to distinguish two ways of forming general ideas.

Automatic
generaliza-
tion.

I. In common thought the process of *abstraction, generalization, conception*, is to a great extent *automatic* and *involuntary*—going on of itself as a natural necessity of thought, without any impulse from desire, or guidance of will. Many objects are always impressing themselves on the mind in perception; and concrete ideas of them are always being formed by operation of judgment and association, until mind becomes weary of their multiplicity. But in the case of every set of concrete things

which resemble each other, *i. e.* have attributes in common, the common attributes always strike into the same traces, so to speak, and deepen these, and thereby impress themselves more and more deeply on the mind (especially as they are the most *essential* also, and draw most *attention*). On the other hand, the differing attributes, which differentiate the individuals, not only fatigue the mind by their multiplicity, but also *obstruct*, and thereby tend to *eliminate* each other. This is especially the case when the distinction of individuals is of no importance nor interest, and therefore attracts no attention; as, e.g. when we say, "that is a kite," or "a crow," not caring what particular kite or crow it is, because it belongs to nobody. In this way, the general and essential, and therefore common attributes of every class tend to impress themselves more and more deeply on the mind, while the inessential ones, which are peculiar to individuals, tend to eliminate each other, and be forgotten.

Elimination
of the inessential.

Thus attention becomes automatically restricted more and more to the essence or essential attributes of every class or kind; and these become more and more *abstracted* or separated from the rest, and integrated together into a separate idea by themselves; and the power and habit is acquired of thinking them more and more by themselves, to the exclusion of particular individuals; and thus a *concept*, *notion*, or *general idea* is formed automatically.

The primitive
concept.

What then remains of the particular individuals which constitute the class? As long as the abstract idea continues to be a *concept* or *general idea*, this much remains—that the concept always carries with it some vague consciousness of the fact that it represents and stands for a plurality of individuals, *i. e.* it has always some reference to individuals, and some tendency to embody itself in concrete representations of individuals.

Thus mind, in proportion as its thinking power develops, comes to think more and more in terms of

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Thought becomes more and more abstract.

concepts or general ideas, and less in terms of concrete individuals. And many minds seem almost to lose the power of representing concrete images of individual things, their power of conception and generalization almost superseding that of concrete imagination.

Galton, some years ago, investigated the power of *visualizing*, or forming concrete *visual* images, in this way. He sent inquiries to some thousands of persons, as to what was present to their minds, when they thought of the table at which they had breakfasted. Some answered that their memory-image was nearly as vivid as the original percept had been. But many, especially scientific men, answered that, though they *understood* the words well enough, they could form no image whatever of the thing. In these minds, therefore, the power of conception or general thought, had superseded that of imagination, or particular and concrete thought.

Generic images.

Automatic conception of the above kind has been compared to what is called composite photography. When many images of persons, or animals of the same kind, are photographed over each other, on the same plate, the differences are found to eliminate each other, and the similarities to amalgamate; until at last a fairly distinct "generic" image is obtained, combining what is common to all, and omitting individual differences. The concept, however, differs from the composite photograph in this, that it contains no consciously concrete "generic" image—that the amalgamation which takes place would seem to be subconscious, giving the feeling and conviction that there is such a common essence of things, but no concrete picture of it.

Voluntary generalization analysed—classification.

§ 107. II. But conception does not always proceed in a purely automatic way. It is often carried on *intentionally* and by *effort of will*, in order to simplify the confused plurality of things by reducing them to classes, and thereby to make the memory and understanding of them possible. In cases of this kind the different *factors included in the process* become more or less explicit and distinct, and we can see that they include—

(a) *Comparison*—or the bringing together and comparing of many different individuals, with *analysis* of

them into their different parts, attributes, and modes of operation, in order to compare them in all respects, and to discriminate between what is most *fundamental* and *essential* in the nature of the things, and what is merely superficial and accidental—

(b) *Assimilation*—or the discerning of those attributes which are *general* and *common* to many things, as distinguished from those which are peculiar to individuals only,—and especially those common attributes which are most *fundamental* and *essential*, as distinguished from those which may be superficial merely—

(c) *Abstraction*—or the *concentration* of attention upon these *common and essential attributes* to the exclusion, as far as possible, of the rest; and the attempt to *abstract*, *i. e.* draw away and separate these from the rest, and think of them, as far as possible, by themselves (or, what is the same, to think of a thing having these common and essential attributes only, without the particular and inessential ones).

These attributes then which are common and essential to a whole class of things, integrated by attention into an idea by themselves, and abstracted as far as possible from the variable and inessential ones which distinguish individuals, constitute a *class-idea*, and this process of voluntary comparison and abstraction constitutes *classification*.

What then becomes of the individuals constituting the class? There cannot be a *class-idea* without reference to individuals. The truth is, the concept is not a *perfectly abstract* idea. Though it contains no concrete image of any individual, it is always accompanied by the understanding that it represents an indefinite plurality of individuals, past, present, and future, every one of which is a realization or embodiment of it. It is this reference to individuals that makes the concept, to be a *general* or *class-idea*, and conception to be *generalization*.

But abstraction is a thing of degrees, and may be carried a step beyond the making of the concept. All reference to a class of things may be dropped, and then the idea ceases to be a class one, and becomes entirely

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Assimilation.

Abstraction.

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abstract. Thus *ball*, *man*, *just man*, are concepts, having reference to classes of individuals, but in *roundness*, *rationality*, *justice*, abstraction has been carried to its utmost limit, and all allusion to individuals has been eliminated. But these logical processes are supplemented by—

(d) *Naming*—For the concept by itself is more or less abstract, and gives no hold, so to speak, to the mind, by which it can be *fixed*, *retained*, and *recalled*. For this, it has to be attached to something concrete, which can be easily retained and reproduced and communicated from one mind to another, and which will revive and communicate the abstract idea along with itself. This is accomplished by *associating* the idea with a *name*. The name is easily retained and reproduced, and reproduces the idea by *contiguous association*; and is easily communicated by voice or writing to other minds. Hence language seems essential, if not to the forming, at least to the retention of concepts and the communication of them from mind to mind.

The use of
language.

This suggests the question of *the relation of language to thought*. What is *the use of language*? Is thought possible without it? From what has been said, it would appear to be impossible to retain and communicate general and abstract ideas, at least, without their being associated with something concrete, which will fix, revive and suggest them; and it is very doubtful whether abstract ideas could be formed and used at all without the support of concrete signs. And though gestures and other visual signs might serve the purpose to some small extent, yet the only kind possessing sufficient variety to represent all ideas, and sufficiently easy to communicate, is *articulate sounds* or *speech*, so that the term language has become almost restricted to speech. Now it is possible that thought of a very elementary kind may be carried on in terms of the concrete ideas of memory and imagination; yet for all purposes of rational thought and inference, general and abstract ideas are, we have found, indispensable; and hence it is doubtful how far such thought is possible without language. Hence Max Muller argued that thought is

altogether impossible without language; that want of speech is the chief obstacle to mental development in animals; and that in man, reason has developed *pari passu* with the organs of articulation, and the art of using them.

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§ 108. Nevertheless, the precise nature of the concept has been the subject of a long controversy. What precisely is it that is *present to consciousness when we think of classes of things, and use general and abstract terms*? Can we really separate the concept from the ideas of individual concrete things, and think of it by itself, as supposed above? Or, in order to think it, do we really *embody it always in one or more concrete ideas* as examples of their class, so that the abstraction is more apparent than real? Is the abstraction of the concept really an accomplished fact, or only an end towards which thought always strives without ever being completely successful? These opposite ways of understanding it led to the controversy between *conceptualists* and *nominalists*.

Controversy
as to the
nature of the
concept.

1. *Conceptualism* inclined towards the view that we can literally abstract in idea the essence of a class, and think of it by itself; or *form a notion of a thing possessing the essential attributes* of the class alone, to the exclusion of the variable ones. If this be so, then the general idea *triangle* will have to be, as Locke said, an idea of a plane rectilineal figure which is "neither oblique nor rectangle, neither equilateral nor scalene, but *all and none* of these at once." The idea of *man* will have to be an idea of one who is neither young nor old, neither short nor tall, neither stout nor thin, because these attributes do not belong to the essence of man. The idea of *animal* will be neither of bird, nor of beast, nor of insect, but of something which is common to them all. We shall have to think of *motion* without thinking of anything moving.)

Conceptualism.

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But is such abstraction of essences from things really possible, even in idea? Is it not true rather, as Hume says, that when we use general terms, we always find ourselves picturing in our minds one or several concrete things suggested by the terms, as representatives of the class? Hence—

Nominalism.

2. *Nominalism* therefore maintained that there is really no such thing as abstraction in the sense of separating attributes from the things to which they belong, and thinking them by themselves. What is really general and common to all the individuals of a class, and yet separable from them in thought, is not an *idea*, but only a *name*. The names *triangle*, *man*, *motion*, are general and common to whole classes of things; and when any name is used it raises in the mind, by contiguous association, some concrete image of some real or possible concrete individual, or several individuals as specimens of the class; and these—the name and the concrete image which it brings up—are all that is present when we generalize and think of classes of things.

Its difficulties.

But there are difficulties here also. In thinking, reading, and listening, do we really take the time and labour which are needed to picture in our imagination even a single concrete representative of all the classes and abstract terms used? And if we do not, how is it that we understand what we read or hear? This would be impossible on the nominalist theory. Hume himself admits that we understand language without “spreading out in our minds” the concrete ideas which the words denote. “If instead of saying that, in war, the weaker always have recourse to *negotiation*, we should say that they have always recourse to *conquest*, we immediately perceive the absurdity.” But how is this quickness of perception possible on the nominalist theory?

Again, if general terms did nothing more than suggest individual concrete examples, there would be no difference between them and proper names. When the nominalist says that they are general because they sug-

gest *classes of things*, he is evidently assuming all the while that we have ideas of classes, *i. e.* class-ideas.

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§ 109. Hence many attempts have been made to mediate between, and reconcile these extreme theories. Thus (1) Berkeley says that *particular* ideas are rendered *universal* without any real abstraction, in this way : we have before our minds a particular image only : but *we think it as "signifying" or "representing" many other particulars ; e. g.* I have before me a particular triangle, but I understand "that it doth equally stand for, and represent all triangles whatever, and is in that sense *universal*."

Attempts at
compromise.

Berkeley.

Thus, as in geometry we draw particular triangles and circles, and think them as representing their classes, so in thinking generally, we picture concrete examples, but think them as standing for classes.

(2) Mill, again, thinks that in thinking general terms, we have indeed concrete images before the mind, but *concentrate our attention most upon the common essential attributes*, leaving the particular ones obscure ; and understand these essential ones as common to the whole class of things, though we cannot abstract them wholly from the individual things.

Mill.

But it is clear that all these attempts really assume what they are trying to explain away and dispense with, *viz.* the *general idea*. For when it is said that particular ideas have a *general reference*, or *represent classes*, it is clearly assumed that we *have* general ideas of classes, otherwise such reference of *signification* would be meaningless.

(3) Less sophistical is the theory of Leibnitz and Hamilton about *symbolical thought*. Ideas, they say, become so closely associated with concrete symbols, chiefly words, that in thinking, the symbols can be used and understood without any need of picturing the ideas for which they stand. Thus abstract thinking is like algebraical calculation. It is sufficient to know that we

Leibnitz.

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can verify the process by substituting the concrete ideas for the symbol, whenever we like.

But the analogy does not hold good. Even in algebra we have ideas as well as symbols, *vis.* ideas of equality, containing and being contained, and the like, without which the symbols would be meaningless. So in abstract thought, the words would be as unmeaning as those of an unknown language, if they were not accompanied by ideas. And the question, what the ideas are, is left unanswered.

Appeal to
subconscious
ideation.

Now all these opinions seem to assume that thought, in order to be thought, must always be in terms of *concrete representations*, *i. e.* in the form of definite pictures before the mind's eye. This, however, is contrary to fact. And the solution of the difficulty as to what abstract thought is, seems possible only by the hypothesis of *subconscious mental processes*. Concepts and abstract ideas may be realized, but only subconsciously; the effort to raise them into clear consciousness may never be quite successful; and yet they may give to consciousness the feeling and conviction of their existence, and of our understanding what we are thinking, hearing or reading.

The controversy on the subject of *realism*, commonly combined with the above, belongs really to metaphysic and philosophy, and need not be considered here.

Other questions connected with conception are—the *relation* between judgment and conception, the *accuracy* of concepts, the *categories* or fundamental aspects of things and the *development* of conceptual power,

Reasoning.

Nature and
use of reason-
ing.

§ 110. This is the process by which *we apply the knowledge of things which we have acquired by direct perception in the course of our experience, and elaborated into ideas, concrete and abstract, by processes of judgment and conception, as means of reaching out to a knowledge of things which are past, distant and future, and therefore have not entered into our experience.*

The experiences of every individual are necessarily limited in time and place. He has, to be sure, the ex-

periences of others communicated to him by speech and writing (testimony), but his power of believing and realizing even these involves an element of reasoning. And even the recorded experiences of all men collectively are narrow ; so that the greater part of knowledge consists of truths which have never been experienced by any one.

This extension of knowledge, then, beyond the bounds of actual experience is the work of *reasoning* or *inference*, the highest function of reason. And the means and materials for reasoning are prepared by the interpretation of sensations and feelings in *perception* and the elaboration of percepts into *concrete* and *abstract* ideas by judgment and conception. And the *guiding thread* which leads the mind from things experienced, to past, distant and future things not experienced, is the *concept* or *general idea*. For what is found true in experience, of things possessing a certain essential nature, can be inferred to be true outside experience, of all things possessing the same nature.

The concept, therefore, is always the middle term which enables us to reason outwards from the known to the hitherto unknown. And to determine the condition under which this may be done successfully, is the function of Logic. Psychology has only to analyse the mental processes involved.

§ III. But reasoning, like conception, may be more or less *implicit* or it may be *explicit*, and these two forms may be treated separately. Thus—

A. Reasoning is *explicit* when it is carried on *consciously and intentionally by an effort of will, for a desired end*, so that the different steps involved in the process become *separate and distinct*. It is then found to include two stages or phases, *vis. induction* and *deduction*.

I. *Inductive reasoning* is reasoning from *particular facts* given by perception to a *universal truth* extending

Explicit
reasoning.

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analysed.

beyond the range of actual perception, and including under it *implicitly* all possible particular things past, distant and future, which come under the same concept. Thus from the facts of experience that a_1 is x , a_2 is x , a_3 is x , etc., we draw the conclusion that all a 's are x , which extends beyond the limits of experience.

What then is the mental process involved in this? The frequent occurrence of a under different circumstances and forms has led us to the *concept* or *general idea* a , *i.e.* the idea of an *essence* or common nature prevailing all particular a 's, at all times and places. And finding that a is so often accompanied by x , we think that x must have some natural and necessary connection with the essence a , so that wherever a is, x must accompany or follow. Hence we pronounce the universal judgment that all a 's are x , thus finally amalgamating x into one idea or whole of thought with a , and *universalizing* their connection. The practical difficulty is to know whether the occurrence of a along with x in the cases observed is a sufficient warrant for assuming such an essential connection between them; and to lay down guiding rules on this subject is the business of *Inductive Logic*.

Thus a child arrives at the general truth, that *wood floats*, in this way. He picks up a piece a_1 by chance perhaps, and throws it into the water, and sees that it floats. This amuses him, and he throws other pieces, a_2 , a_3 , and so on, and finds that they all float (while pieces of stone and iron sink). He at last draws the conclusion (though perhaps *implicitly*) that all wood floats. He has come to think, *implicitly* at least, that though there are many pieces of wood, yet all wood has a *common nature*, and that there is a essential connection between that and floating in water. Hence his generalization. And most, if not all, of our general propositions are arrived at in this way, by induction from particulars.

What then is meant by *generalization*? The term

is applicable to two processes—the generalizing of *ideas*, and the generalizing of *judgments*—the making of *general ideas*, and that of *general propositions*; and therefore applies to both *conception*, and *inductive inference*. Thus:—

(i) In *conception* we analyse particular ideas into their constituents; observe what is essential and therefore common to many; and, by abstracting (so far as *abstraction* is really possible) the essential attributes, integrate them into an idea by themselves, of what is *general* or *common* to a whole class, and this idea is accompanied by the understanding that it represents the common essence of many individuals.

(ii) In *induction* again, from a plurality of singular judgments founded on perceptions, we rise to a general or universal judgment, embracing the whole class, past, present and future.

II. *Deductive reasoning*, on the other hand, starts from *general truths* already established, (i.e. from general ideas already formed, and known to be objectively true), and applies them to establish the truth of particular facts, lying beyond the range of experience. This is done by showing that the particulars in question are in some way implied in the general truths already established.

Thus when we reason, all *a* is *x*; *s* is *a*; therefore *s* is *x*—we have a concept *a*, corresponding to an essence, or set of attributes, which always carries *x* with it as accompaniment or result, and which we know (generally at least) as the result of previous induction. We know also, whether by perception or previous inference, that *s* shares in, or follows from the essential nature of *a*. It follows, therefore, that *s* will be followed or accompanied by *x*.

Thus, to recur to the above example, the child, having formed a general idea of wood as something having a common nature, and found that the attribute of floating in water follows in some way from that common nature, concludes regarding every new piece that he meets with, that it also will float.

It is clear, therefore, that the *concept* or idea of the *essential* nature which makes all the members of

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Implicit rea-
soning.

a class, present, past, and future, to be so far the same, is the *key* to all reasoning. Induction ends with establishing its existence; and deduction starts from it.

§. 112. B. Reasoning on the other hand is *implicit* when the processes involved *are carried on to some extent subconsciously and automatically*, or at least are so *fused together in consciousness as not to be clearly distinguished*, so that the mind arrives at results without clearly understanding how.

Thus we often draw inferences not only without stating our premisses to ourselves, but even without knowing clearly what our premisses are; or even without being aware that we are drawing inferences at all. Hence processes of inference, and often very complicated calculations, may be performed so rapidly and automatically, that their conclusions are mistaken for perceptions, or self-evident intuitions, *e.g.* the acquired perceptions.

This, in the above example of the child with the pieces of wood, the reasoning, if stated explicitly, would amount to this—

Inductive— a_1 floats, a_2 floats, a_3 floats, etc; therefore all wood floats, *i.e.* there is something in the nature of wood which makes it float—thus rising to the *concept* or *general idea*.

Deductive—all wood floats; a is a piece of wood sharing in the common nature (concept) of wood in general; therefore it will float.

But the child is not distinctly aware of all these steps. The process has worked itself out in his mind spontaneously and to some extent, it would seem, unconsciously; and the child reaches his conclusion without knowing how.

Of the same nature are the so-called *acquired perceptions* of *vision* and *hearing*. We think that we *see* the distance, real size, and solidity of things, though we know that they are really *inferred* from the appearances of the things.

And what is called *practical judgment*, *shrewdness*, *common sense*, in the affairs of life is really a power

Examples of
implicit rea-
soning.

of drawing inferences rapidly and automatically, without any explicit statement, or perhaps even understanding, of the premisses.

Extreme examples of this power of subconscious inference are seen in the persons called "wonderful calculators," who has been found to perform in a moment the most complicate arithmetical calculations that could be suggested, without even knowing how they performed them.

XXII. KNOWLEDGE AND BELIEF.

§ 113. All the intellectual operations aim at the attainment of *knowledge*. By knowledge we mean a *system of ideas, (the result of many perceptions and inferences,) which will correspond in form, order and connection with the system of objective things and events which constitute the world of nature and mind.* To have ideas corresponding to what has been, is, or will be, is to have *knowledge*. To want such ideas is *ignorance*. To have ideas which do not correspond to realities, while believed to do so, is *error*.

Knowledge therefore supposes not only our having the ideas, but also, the *truth* of the ideas (their correspondence with reality), and the awareness or *belief* of their truths—though the *belief* may exist without their being true. Uncertainty, again, as to the truth of ideas is *doubt*—the true opposite of belief (*disbelief* being merely belief in the negative).

• Knowledge is therefore a reproduction of *things* in terms of *idea*—of the objective world in terms of mind—of the *macrocosmus* or great world of nature, in terms of the *microcosmus* or little world of thought; and the reason why every thinking being naturally and instinctively strives after knowledge is, no doubt, that knowledge is necessary to its own continued existence and perfection. From this it follows that the highest kind of knowledge is knowledge of the future; and that knowledge of the past and present is of value mainly as enabling man to infer from the past and present to the future, and thereby to adapt

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Meaning of
knowledge.

Knowledge
supposes
truth of ideas

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Two aspects
of knowledge.

Phenomenal.

Metaphysical.

Knowledge
involves
belief.

Nature of
belief.

Its relation to
intellect.

himself to the future events, so as to promote his own safety, happiness and perfection.

The two different *aspects of the truth and kinds of knowledge—phenomenal and metaphysical*—have already been referred to, and have to be treated again in logic, *viz.*—

Phenomenal or experiential knowledge—consisting in a system of ideas corresponding to what has been, might have been, or will be experienced by beings constituted like ourselves—knowledge in terms of phenomena, *i.e.* of the sensations and feelings through which realities manifest themselves to us—the knowledge aimed at by *empirical science*; and—

Metaphysical knowledge—consisting in a system of ideas corresponding to the ultimate grounds and causes which give origin, connection and meaning to phenomena.

The combination and harmony of those two aspects again in a single system constitutes *philosophical knowledge*.

✕ Knowledge is therefore a product of many judgments, both perceptual and inferential ones, and includes therefore the state of mind called *belief* which we have found to accompany every real judgment. But there may be belief without knowledge, *i.e.* it may accompany false ideas and judgments as well as true ones—*error* as well as knowledge. It is desirable, therefore, for both psychological and logical reasons to *investigate the nature of belief*. Hence we have (1) to consider *what belief is*, and (2) *what its grounds and causes are*, in order to understand better when it may coincide with truth and when with error.

§ 114. 1. *What then is belief? To which of the ultimate functions of mind does it belong—intellection, feeling or volition?*

✕ (1) Some have referred it to *intellect*. In that case it would be some factor of judgment or ideation. But though it accompanies *ideas*, and the *forming of new ideas* by means of judgment, it can hardly be itself any constituent of idea or judgment, because we can have both without belief.

(2) Bain thinks that it belongs to the department of *will*, and is a factor in every act of volition. For to *believe* in anything means *to be ready to act upon it, i. e.* either to make it an *end* of action, or to use it as a *means* for attaining an end. Belief, therefore, is *that state of mind which is always ready to overflow into action* whenever occasion arises, and is therefore *the initial stage* of every *voluntary act*—a factor of volition. And this readiness to act is clearly implied in such words as *confidence, assurance, trust*, which are nearly synonymous with belief. But the readiness itself would seem to imply a *feeling*. Hence

To volition.

(3) Hume therefore described it as a state of *feeling* or *emotion simply*. We are always engaged in a struggle to attain the truth about things. Conscious ignorance and doubt are states of *unrest*, and the effort to escape from them by attaining truth is a *labour*. When the truth is attained or seems to be, then there comes a feeling of *relief, satisfaction, and rest*—of difficulty overcome—and this feeling is belief.

And to feeling.

This peculiar feeling is probably the *differential* of belief. But it *arises out of the intellectual cognition of correspondence* (or what appears to be such) *between idea and reality*, and is accompanied by, or produces the *readiness to act* when occasion arises; so that belief may fairly be considered to include all three elements, but to consist *more especially* of the *feeling of trust and the readiness to act*.

§ 115. 2. Finally, we may consider *the grounds or causes* out of which belief arises. How may *error* or *false belief* arise? In as much as belief always goes with knowledge, it will thus far have the same grounds as knowledge itself, and *be under the control of logic*. But in as much as belief arises also without knowledge, (*i. e.* in connection with ideas and judgments which do not correspond to reality), it must have other grounds also than those of real knowledge, and thus far lie outside

Conditions of belief.

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Intellectual.

the sphere of logical control. Hence it will have—

(a) *Intellectual grounds*—belief will arise partly out of the same grounds which produce conformity of idea to reality, *i.e.* lead to real knowledge; and these we may call the *intellectual or logical causes* of belief. These will include, of course, the ordinary sources of knowledge.

Perception.

Immediate cognition or perception, external and internal, for the evidence of the senses and of self-consciousness is always appealed to as the one ultimate and decisive test of truth for everything coming within the range of experience; and *mediate cognition or inference*, extending the range of knowledge and belief beyond the range of experience to things past, distant and future. These sources, and the right use of them, fall within the sphere of logic.

Inference.

Testimony.

Testimony or authority, upon which great part of our beliefs directly rest (for every one assimilates the accumulated beliefs of the society in which he lives, on the *authority* of his ancestors and contemporaries) is a complex source of belief, as its convincing power is (1) partly that of *logical inference*—we infer that what we hear from others must be true, because they have had opportunities, we think, of knowing, and have no motive to deceive us; and (2) partly that of *emotional interest*—we believe what others tell us partly because they impress us with feelings of love, reverence, admiration, wonder; as *e. g.* people formerly accepted the authority of Aristotle and Thomas Aquinas. Hence belief has also—

Non-intellectual.

(b) *Non-intellectual grounds*, and these are the main causes of erroneous beliefs (though perception and inference may also err), because they make belief extend beyond the range of perception and strictly logical inference. These are especially—

Association.

(1) *The force of association*—when two things frequently go together in experience, they become *inseparably associated* in idea, so that we are unable to think of them apart from each other, and thus come to believe that the things have some *necessary connection* in nature.

Thus one who has never seen ice will naturally believe that water is always liquid. People could not believe in the movement of the earth, because it was so associated in their minds with perfect stability. Hence also the logical fallacy, "with this, therefore because of this."

Akin to this is the influence of *verbal suggestion*. When a judgment has been expressed and repeated in a suitable and "catching" form of words, so as to be easily understood and remembered in that form, then the mere form of words is apt to impress itself on the mind, and produce belief automatically. Words are also subject to ambiguity, and may suggest meanings which they were not meant to convey

Feeling.

(2) Of still more importance, perhaps, in producing belief, *is the influence of strong feeling*. When a judgment or idea excites any strong emotion, such as fear, hope, wonder, reverence, the feeling stimulates the imagination and makes it evolve trains of ideas in harmony with the feeling, and impresses them vividly on the mind. This flow of consciousness into the forms of feeling and imagination leaves the reasoning power weaker for the time being, so that the ideas of imagination have the field all to themselves, and work themselves out into *belief*, and perhaps into action.

In this way, strong feeling (passion) tends to "warp judgment," and produce erroneous beliefs. Hence the force with which superstitious ideas lay hold of the mind, and make themselves to be believed; and the effect of fear, hatred, self-interest, jealousy and the like, in *prejudicing* judgment.

Temperament.

(3) Indeed *the general temperament of the mind* has a great influence on belief, apart from all logical evidence. A cheerful, sanguine disposition makes one ready to believe. An inclination to activity tends to carry conviction along with it, and disposes one to believe in the ends and means of action.

Thus, if one is strongly inclined to any course of action the mere inclination tends to suppress the thought of danger and discomfort.

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XXIII. EXPERIENCE AND REASON.

How far is
knowledge
due to expe-
rience, and
how far to
reason ?

§ 116. *The question of the nature and origin of knowledge raises certain questions, which have always divided opinion, and which are not yet settled to the satisfaction of all ; and foremost among these is the question of the function and relative importance of experience and reason as factors of knowledge. We say that knowledge is due partly to experience and partly to reason ; and we speak of intellect as sometimes engrossed with matters of experience, and sometimes as exercising its function of reason. We have to consider first, therefore, what experience and reason mean, and then to consider the question of their scope and range as sources, or at least factors, of knowledge. Now—*

Meaning of
experience.

I. (a) The word *experience* is used in a general way for what enters or forces its way into consciousness from the sphere of reality existing apart from and independent of consciousness ; in other words, for the states and terms of consciousness in and through which realities manifest themselves to the thinking mind ; and therefore for *sensations and feelings and the ideas which rise out of them* (so far as they are not supplemented and modified from within by reaction of the rational power).

Subjective
and
objective.

• And reality seems to manifest itself to, and enter into consciousness from two sides. Extra-mental reality, or the external world, manifests itself in the form of sensations ; the reality of self manifests itself in all forms of consciousness alike (*viz.* in the self-consciousness which accompanies them all). Thus all states of consciousness are experience in their elementary forms, because they are all manifestations or phenomena, reflecting reality of some kind.

But even though sensations and feelings did force themselves into consciousness without the connecting and unifying energy of the self (and the existence of consciousness in the lower animals seems to show

that it is possible without reason, yet they would be *meaningless* without the self's interpreting and elaborating power • which we call reason. They would not be knowledge, but only the *materials* out of which knowledge may be evolved.

(b) *Reason*, therefore, in its strictest sense, means the power which the mental principle has of *interpreting, understanding, elaborating* the materials supplied to it by sense and feeling so as to transform them into knowledge; which it does by means of *perception, judgment, abstraction, conception, and inference*, and the *understanding or power of interpretation implied* in these processes—arriving thereby at a conception of the world as it permanently is, through its fleeting manifestations in sensation and feeling. *Without this interpretative power on the self's own part, the sensations and feelings would be as meaningless to it as the finest picture is to an animal, or as a printed page is to an illiterate person.* And this power which the subject has of *interpreting and understanding* the materials supplied to it in the form of sensation and feeling, is *reason* in the proper sense of the word.

The function of reason.

* Now it clear is from the above that neither experience nor reason can constitute knowledge by itself. Each by itself is only a "factor." The "materials" of sensation are nothing to knowledge until interpreted by the self through its rational power; *reason* itself can do nothing without materials to interpret. *Knowledge results from the co-operation of the two.* Experience may be said to supply the material of knowledge in the form of sensation and feeling; while *reason* interprets and elaborates these materials, and evolves from them a system of ideas corresponding in form, order, and connection to the things and events which constitute the world; and *understands* this system of ideas as representing the world. And this system of ideas, with the understanding and belief which accompany them, constitutes knowledge.

Reason without experience, an empty form—experience without reason, blind.

Both words, however, are used with different meanings, and often with very indefinite ones. Experience is often used • to mean knowledge • derived from *direct*

Different uses of the word reason.

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perception, as distinguished from abstract reasoning; or for perceptual and inductive together as distinguished from deductive knowledge; and especially for knowledge from which all metaphysical meaning is supposed to be excluded— knowledge supposed to be in terms of phenomena, *i.e.* of sensation and feeling, alone. And reason is sometimes used for the *power of discerning the truth of those universal propositions called axioms, first principles, or necessary truths*, which are supposed to be postulated as ultimate premisses in all knowledge. But such uses have the fault of separating, and setting in opposition to each other, as if they contradicted each other, functions of thought which are really correlative and inseparable.

Division of opinion as to their relative importance.

§ 117. II. Nevertheless the precise relation of these factors of knowledge, and the share contributed by each to the common product, *viz.* knowledge, has proved to be one of the most difficult problems of philosophy (so difficult, indeed, that it has led some to define philosophy as if it were nothing more than "theory of knowledge," *i.e.* an enquiry into the origin and constituents of knowledge); and has divided philosophy, almost from its beginning, into two schools—the *a posteriori* or *empirical* school, with a tendency towards a materialistic metaphysic, and the *a priori* or *rational* school, with a tendency towards idealism. Thus, in their extreme forms—

The empirical school.

(a) At the one extreme—*there is the tendency of the experimental school, to ascribe everything to the factor of experience or impression from without, and minimize or ignore the part played by the interpretative activity of the self from within.* And this tendency reaches its extreme, and perhaps most consistent form, in what has been called—

The associationist and materialist theories of mind—mind, a passive product.

• *Sensationism or associationism*, which regards mind as nothing more than the aggregate of the sensations and feelings imposed from without (whether on the brain, or in some unknown way). These associate themselves together, and revive each other as ideas,

in clusters and series; and thought is nothing more than the spontaneous coming and going, rising and sinking of sense-ideas, according to the laws of association. No self is needed to understand and elaborate the sensations, the self being in fact nothing more than the aggregate or product of the sensations themselves. The working of mind is only the automatic mechanism, so to speak, of sensation and suggestion themselves; and these receive from without the impulse which keeps their mechanism going. The changing states of consciousness are a passive reflexion of the changing processes of nature; and mind itself is nothing more than the series or aggregate of these changing states (Hume and Mill).

Materialistic metaphysic leads to the same view of mind, but at the same time attempts to account for this apparent mechanism of sense-ideas, by a real mechanism of brain processes, whereas associationism adhered to the sceptical stand-point.

(b) At the other extreme there is the tendency of the rationalist and idealist school, to ascribe greater importance to the *a priori* element, or contribution of reason from within. The sensations and feelings, even if they were possible as such (and we may suppose even a worm and mollusc to have feeling of some kind), would have no meaning whatever apart from the interpreting power of reason. They would be as meaningless as the picture to the animal, and written characters to one who cannot read. And though the materials—the sensations and feelings—may be impressed from without, the power of interpreting them, of reading their meanings, must be inherent in the thinking principle itself, and not a passive product of impressions from without.

Mind is therefore an *active principle*, which is limited, modified and affected from without, but reacts upon its affections, and not only transforms them into sensations and feelings, (for the animal mind seems sufficient to do that), but *interprets their meanings in*

The rationalist school.

Mind an active principle.

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perception, turns percepts into ideas of memory and imagination, and builds up its ideas into a system of thought, corresponding in order and connection with the world of reality past, present and future.

Idealism.

How, then, is this correspondence between the world of ideas and the world of reality, the microcosm and macrocosm, and this *understanding* of the one as a reproduction of the other, to be accounted for? It cannot be by merely comparing the field of consciousness to a photographic plate, and supposing that passing events photograph themselves in a series of conscious pictures,—which is substantially the explanation given in the sensationist theory. It can be only by supposing that the power which has evolved the world is itself rational; and that the finite reason which builds up its *little world of ideas*, is in some way a “reproduction” of the universal reason which has evolved *the great world of things*; so that the laws of thought according to which the finite rational self interprets and elaborates the materials of its consciousness into a world of ideas, are essentially the same in kind as the laws which govern the evolution of the world of nature (idealism).

These opposite tendencies then—the *empirical* tendency to explain knowledge as sensations and ideas impressed from without, making mind to be a passive product, without any independent constructive reaction of its own—and the *idealistic* tendency to make knowledge a construction of finite reason, reconstructing, in terms of finite thought, the world which has already been constructed by universal reason—have run through the whole history of thought,—on the one side from Democritus and Protagoras down to Hume, Mill and Spencer, and on the other from Plato down to Kant, Hegel and T. H. Green.

Intermediate
positions.

§ 118. But attempts have been made also to mediate between these extreme tendencies, and to determine the respective contributions of experience and reason to knowledge—its *a posteriori* and *a priori* elements—without giving such exclusive predominance to either. Such attempts at compromise are seen in the theory of *innate ideas*, as held by Descartes and Leibnitz, the *a priori* categories of understanding as held by Kant, and the

theory of *intuitive* first principles or *axioms* of knowledge as held by Reid and Hamilton.

Indeed, in English thought, the question has narrowed itself down mainly to a controversy about *the origin of those general propositions which are used as the axioms of the sciences* and the *fundamental laws of ethics*; viz. as to whether these propositions are *discerned intuitively, by exercise of reason, to be universally and necessarily true (the intuitional theory)*, or are only the *conclusions of inductive inferences* drawn from particular facts of experience (the *empirical theory*). Thus—

(a) *The empirical school*, as represented by Mill, Bain and Spencer, say that all knowledge begins with particular facts of experience, and that all general and universal propositions without exception are obtained by inductive inference from particular facts of experience; and none possesses any greater degree of certainty than inductive inference from invariable experiences can give. There are no universal propositions that are intuitive or self-evident, and none that can be known to be necessarily and universally true. If any appear to be such, it is only because their opposites would involve self-contradiction (for even this school must assume the necessity of the logical axiom of identity).

Thus, even the axioms of the sciences, such as "two parallel lines in the same plane cannot meet," "things equal to the same thing are equal to one another," "every event has a cause," "the same cause has always the same effect," etc., notwithstanding their apparent necessity and self-evidence, are really inductive inferences from observed particulars; and differ from other inferences only in being founded on a larger number of observed facts, and therefore better confirmed than others, so that they may be used as axioms or first premises from which to deduce other facts.

(b) *The intuitional or common-sense school*, represented by Reid, Hamilton, Martineau, etc., say that such propositions are immediately and intuitively self-evident to reason

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The question in English psychology—controversy about first truths or axioms.

The experiential theory of axioms.

The intuitional theory.

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Universality
and necessity
of first truths.

anterior to, and independent of any inductive proof from experience, and neither *need any proof* (because they are self-evident), nor *are capable of any* (because they must themselves be assumed in all proofs). They cannot be mere inductive inferences from particulars, because—

● (i) They are *intuitively self evident* from the beginning (*a priori*), instead of being gradually learnt; and no induction from particulars (which can never give more than probable conclusions at best), could produce the certainty and necessity which these propositions possess.

(ii) They are really *assumed in all inductive inferences* (for even inductions are found to rest on universal truths as their ultimate axioms); and the very inferences used to prove such truths will be found to assume and rest upon the truths which they pretend to prove.

Thus, it will be found, when knowledge has been analysed to the utmost, that there is at the bottom an element, which cannot be accounted for by impression from without (*i. e. experience* in the form of sensations), but must be supplied by the mind itself from within, *i. e. by reason*.

XXIV. SELF AND THE EXTERNAL WORLD.

How the
ideas of self
and external
world become
differentiated.

§ 119. Another question which has been the subject of much investigation and controversy is that of the ultimate cognition of existence or substantial reality, *viz.* the existence of self and the external world—how the ideas of self and world are formed (the *psychological* side of the question), and what is implied in these ideas (the *metaphysical*).

For we have found that perception, internal and external, reveals two fundamental realities, *viz. self* and *not-self* or *external world*, as the grounds manifested in the two series of phenomena, mental and physical. The way in which we know the reality of self has been considered under the head of *self-consciousness*; and the way in which we come to know that of the external world, under *consciousness* and *external perception* (together with the two theories of external perception, *direct* and *indirect*).

• Now it is evident that the ideas of self and world—of the perceiving subject and the object perceived—are correlative to each other in such a way that no explicit understanding of the one can be obtained without an understanding of the other; and that an understanding of the world as something external to, and independent of the ego, must always be accompanied by a consciousness and understanding of the ego itself as the subject which perceives and understands the world; and that the understanding of the ego which thinks and wills must always be correlative to that of the object of its thought and effort, *vis.* the world. It follows that *internal* and *external* perception, *self-consciousness* and *other-consciousness*, being thus far reciprocal and correlative, will develop from an implicit to an explicit form simultaneously; or at least, that the development of each will depend on that of the other reciprocally.

But the question, how the idea of the external world is developed and perfected, has been considered under *Perception*, *Primary Qualities*, *Object of Perception*, *Association by Contiguity*, and *Judgment*. And the origin and contents of the idea of self have been considered under *Mind* and *Self-Consciousness*. Hence—

§ 120. What remains is to consider *how the idea of self is gradually differentiated from the extraneous but concomitant elements in which it is at first embedded* (so to speak), *and reduced to its simplest form*; and the two ideas of self and world made distinct and mutually exclusive.

Differentiation of the idea of self.

For though the reality of self is given implicitly in every consciousness from the beginning, yet it is wrapped up and embedded in a mass of materials which are not part of itself, but only its products; and these extraneous materials have to be gradually eliminated, before the idea of the ego itself can become *explicit and precise*, and along with it, that of its correlative the non-ego or world. And the following appear to be the main stages in the elaboration of the idea:—

I. The thinking principle, whatever be its nature, is connected in a special way with a physical organism,

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Their correlativity.

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The physical
organism as
self.

(1) as the immediate source of a large class of its pleasures and pains (*viz.* the organic feelings); and (2) as the channel through which it receives its sense-affections from the outer world, and through which it reacts upon, and changes its relations with the outer world, and thereby modifies the sense-affections which it receives from it. *Hence the child naturally at first includes his organism within his idea of self*, because:—

• (1) His limbs are always with him as the instruments of his will, whereas his toys, tools, companions, are often wanting; whence he cannot help thinking of his limbs as *parts of himself*, in the same sense as his thought and volition; and especially because—

(e) The conscious life of the child is largely *made up of sensations and organic feelings which are closely connected with bodily organs*, and which (partly by instinct, and partly by habit) he *objectifies and localizes in parts of the organism*, and thinks of as seated in, and as states or qualities of these parts (as *e.g.* he localizes taste in the mouth, and the pain of the cut or burn in the foot or hand, and so on);

Hence, as the conception which we form of other persons consists mainly of a concrete representation of their outward appearance, so *the child's conception of self appears to consist mainly of a concrete pictorial representation of his own person*. And hence, perhaps the tendency of children to speak of themselves in the third person.

The aggregate of mental states as self.

II. But, as his differentiating and assimilating powers of mind go on developing, he begins to find that his organism is *less subject to his will, and has more in common with extra-organic things*, than he was at first aware of, for—

(1) It has impenetrability and weight, and resists his will, and forces sensations (*e.g.* organic pains) upon him whether he will or not, as external things do; and—

(2) His conscious life begins to consist more and more of *elements which do not obviously appear to have any connection with the body, viz.* ideas, thought-processes, and higher emotions.

• Hence he begins to differentiate more and more between self and organism, and to assimilate the latter more and more to the extra-organic not-self. And thus there would appear to be a stage in mental development at which the individual *thinks mainly of the series or aggregate of his own conscious states as constituting his self*, (which Hume and his school take to be the only true idea of it).

III. But, if this stage really exist, it is soon superseded by another differentiation. Sensations, ideas, feelings and volitions are only *temporary processes, and manifestations of something*, and imply a subject which experiences them and the individual has had an *implicit* consciousness from the beginning—

(1) Of himself as the *subject* or *agent* of these processes, *i. e.* as the something which thinks, feels, and wills; and—

(2) Of the *permanence and identity* of himself as the subject of all the successive processes which make up his mental life.

Nevertheless, it is not until the intellectual power of abstraction is pretty fully developed, that he is able to isolate in idea the common *subject* of his thoughts, feelings, and volitions from their processes and products. But when sufficient power of abstraction has been attained, then at last the notion of self, which has been present implicitly from the beginning, is separated from the mass of extraneous thought in which it has been imbedded—ideas of organism, and mental processes and products—and the self begins to be understood as the *permanent and substantial centre of energy* of which feeling, thinking, willing, and bodily movement (and perhaps body itself) are outward manifestations in time and space.

• And wherever he meets with similar external appearances and manifestations, he infers the operation in them of thought, feeling, and will, and therefore also

The thinking
principle as
self.

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the existence of a substantial self of whose character they are manifestations; and thus arrives at a knowledge of other persons, and at a general idea of personality.

And not only so, but the reality which he is conscious of in himself becomes to him the *standard of all reality*, i.e. supplies the idea of substance which he extends even to material things—only omitting in their case, the attribute of thought.

Reluctance to regard self as the type of substance.

• The prevailing reluctance to recognize in the self the ultimate type of reality seems to arise in this way. We regard matter also as substance, and have come to think of matter rather than mind as the type of what is permanent and indestructible. And though visible matter is obviously liable to decomposition, we fall back on the theory of atoms as what is permanent and indestructible. Hence when mind is spoken of as substance, we can hardly avoid thinking of soul after the analogy of a material atom, which is absurd.

But the psychology of perception shows that the idea of matter as substance is not a primitive, but a secondary and derived idea formed by analogy. For we know matter directly only as a series of sensations—fleeting and insubstantial. The idea of its permanency and substantiality has to be *read into the sensations*, and must therefore be derived from another source.

XXV. UNDERSTANDING.

Thought culminates in the understanding of things.

§ 121. We have found that the deepest factor of intellect is *understanding* (§ 30). It is difficult to define precisely in what understanding consists. But it involves at least a power to discern, conceive, appreciate the ultimate relations and connections between things. It therefore accompanies every judgment, because every judgment involves cognition of a relation or connection between two terms, and consists in combining the terms into one whole of thought in virtue of that connection.

Now this helps us to one at least of the elements of understanding, *viz.* the power of supplying the *cate-*

gories or ultimate predicates, under which we conceive things. For it follows that every judgment involves, besides its subject and predicate terms, another notion, *viz.* something in respect of which these terms are related or connected, and which forms the mental background of the judgment, and the connecting bond between subject and predicate.

Thus when we say "the bird is sitting on the tree", this judgment evidently supposes a notion of *space*, as that by which bird and tree are connected into one idea. When we say "gold is heavy," the thing gold and the quality heavy are evidently connected together according to the fundamental notion of *substance and attribute*, which must evidently be present in the mind before the judgment can have any meaning. When we say "water rusts iron," this would have no meaning to the mind, if mind were not provided already with the notion of *cause and effect*.

Now understanding, whatever else it may involve, evidently involves this much—that mind is provided with a framework of ultimate related notions of this sort, which it is continually applying to its materials of experience, in order thereby to interpret and explain these materials to itself; and that it understands them, and incorporates them into its system of knowledge, in so far as it can bring them under, and make them consistent with these fundamental notions. They have been called the *categories* of understanding, and metaphysicians and logicians have sought to determine their number and origin. Aristotle enumerated ten, and assumed that they are objectively real, *i.e.* correspond to attributes and relations of objective things.

Kant enumerated twelve (deducing them from the nature of the logical judgment), but tried to prove that they are only forms under which mind necessarily represents things to itself in terms of its own sensations, and can have no correspondence with reality independent of mind; and drew the conclusion that knowledge is only *phenomenal* or symbolical, and real things *unknowable* (§ 78, p. 216).

Hegel, on the contrary, tried to show that thought

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What is implied in understanding?

It includes at least the ultimate unifying and organizing notions.

Whether subjective.

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Or objective.

Categories
most promi-
nent in psy-
chology.

Theories of
their origin.

Aposteriori.

must itself have its ground in reality, and that the necessary laws and forms of thought must at the same time be forms and laws of the world. And in his *Logic* he attempted to draw out the framework of categories, or necessary thought-forms through which we understand things; and tried to prove that they are identical with the essential forms and laws of nature; and that we understand nature because we discover in it the essential forms and requirements of our own intelligence (thereby identifying metaphysic with logic) § 20, p. 68, § 78, p. 216.

§ 122. We notice here only those fundamental ideas (commonly reckoned amongst the categories) which are most prominent in psychology—*space, time, substance, cause and power*.

These can be seen to be fundamental ideas involved in all judgments. Thus, before we can pronounce the judgment "this is a rose," (adding on to "this" the attributes which make up the idea *rose*), we must already think of "this" as a *substance*, or something existing at a particular *time* and *place* and possessing attributes, which are really *powers* of resisting and reacting on other things and *causing* effects in them. In other words, before the proposition can have any meaning to us, we must supply from within our own minds the notions of *time* and *space, substance* and *attribute, cause* and *effect, and power*; which may therefore be described as *categories of understanding*—fundamental notions or forms under which we must regard things in order to understand them.

But in the first place, we should notice that there has been a radical difference of opinion as to the origin of these and other such fundamental forms of thought—a difference corresponding to the two schools of thought already described, empirical and rational, or *aposteriori* and *apriori* (§ 8). 'Thus—

(a) The *experiential school* say that these are derived in the same way as other abstract ideas, *viz. by abstraction from the materials of experience*. The attributes

connoted by the words are contained implicitly in our sensations, and the ideas which we construct out of sensations. Therefore we have only to analyse our sensations and ideas and abstract these attributes from the rest, and thus get the notions of time, space, etc. They differ from other attributes of things and other contents of sensation only in being more fundamental, and therefore more necessary and universal. Whereas—

(b) The *apriori* school say, on the contrary, that all our attempts to derive them from sensation tacitly assume that we have them already, and thereby beg the question. For we cannot abstract attributes from ideas which we have not previously put into them by successive judgments, (*viz.* in constructing the ideas). And we cannot pronounce judgments, and ascribe predicates to things, without already thinking the things as *substances* in *time* and *place*, having *power* to *cause* effects, *i. e.* without already thinking them under these fundamental forms which constitute the nucleus, so to speak, to which other predicates may be attached.

Apriori.

These forms of thought are therefore in some way *antecedent* (*apriori*) to our experiences of particular things. The mind by its rational or interpreting power supplies them from within itself, and applies them to sensations in order to interpret and understand them. We do not really touch, nor see, nor hear, space, time, causality, and the like, but we *think* they must be there. They are not *objects of sensation*, but *necessary forms of thought*.

§ 123. It will be sufficient however to summarize here what seem the most satisfactory empirical explanations, so far as they go, passing over the difficult question of their sufficiency.

The idea of
space—ex-
periential
theory.

1. *As to space*—the common *experiential* explanation of the idea (given by Bain, Mill, Spencer) makes it to be derived and formed gradually from *muscular experiences of motion and resistance*, aided by touch and

vision, and supplemented by the idea of time. It is formed by a synthesis and fusion of two abstract ideas— (1) an idea of possible motion in all directions (*i. e.* of muscle feelings of all forms); and (2) an idea of the points or positions *successively* passed through, as existing *simultaneously*. When we think of space, we think of unresisted motion in all directions through any number of points, but at the same time, think of the points thus *successively* moved through, as existing *simultaneously*. Thus we come to think of space as an aggregate of points which we experience successively by movement, but which nevertheless co-exist, so that we might experience them simultaneously by touch and vision, if our organs were sufficiently *extensive*.

Thus (i) we experience muscle sensations of all kinds by means of our limbs, and from these particular muscular experiences, we abstract a general idea of *movement*, *distance*, and *direction* (*i. e.* *quantity* and *kind*) of movement.

(ii) We experience also the co-existence of resisting points by means of the hands and surface of the body, and of points of light and colour by the eye; and abstract from these particular experiences, a general idea of *co-existence*.

(iii) Then we learn to associate the general idea of movement and direction (*kinds* of movement) with that of co-existing points (eliminating their resistance as given by touch); and in this way arrive at last at a vague idea of *co-existing positions admitting of motion between and through them in all directions*. And finally,

(iv) By another effort of abstraction, this idea is separated so to speak, from the self which constructed it, "objectified" by imagination, and conceived as existing objectively, independent of mind and everything else.

Still it is a question whether such explanations do not assume, all the while, the idea which they pretend to explain.

Extensivity of
sensation.

Attempts have been made recently by some to derive the idea of space from the so-called quality of *extensivity* or *volume*, which characterizes some sensations. But this quality means nothing more than the *feeling* which results from the simultaneity of many units of impression; and is not known to have any

connection with extension in space, until the idea of extension has already been formed, and applied to explain it.

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§ 124. *As to time.*—As co-existent things, in order to be distinguished from each other, have to be represented as existing *apart* from each other in space, so events have to be thought as appearing *successively* in time. The two ideas are correlative to each other. For co-existence in space cannot be understood without our contrasting it with succession in time; nor succession in time, except in contrast with co-existence in space. And again, to conceive things, we must discriminate them as distinct from each other; but we cannot conceive two distinct things at the same point of space, without conceiving them as successive in time; nor at the same point of time, without conceiving them as apart from each other in space.

Time contrasted with space.

Two questions have to be considered—(1) how we get the idea and understanding of time, and (2) how, having got the idea, we represent events in time.

I. *As to the idea and understanding of time.*—As the clearest discrimination of co-existing units in space, with their directions and distances, is given by *vision*, so it seems that the clearest discrimination of successive events, intervals, and durations in time is given by *hearing* (§ 68). But it may be doubted whether muscle-feeling does not impress the idea more forcibly on the mind, though it does not apply such an exact standard of measurement.

Origin of the idea—experiential theory.

Now the understanding of succession in time, whether by hearing or other senses, may be explained to some extent in this way. When a shock of sensation, A, has been experienced, but its objective cause has ceased, then the after-image of the sensation, *a*, will continue to linger for some time in consciousness before it sinks beneath the threshold. Suppose now that another shock of sensation, B, be experienced. Then the actual present sensation, B, and the lingering remnant or shadow

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of sensation, *a*, will both be present in consciousness simultaneously—B in the foreground, so to speak, and *a* in the background; and the contrast between them will rouse the attention, and compel the mind to explain *a* by thinking of another sensation which *has* been present like B, but has ceased to be so. In this way, by the contrast between the actual sensation in the foreground, and the lingering shadows of 'old ones in the background, it will be awakened to a consciousness of the difference between what is *now*, and what is *no longer*; or between the *present*, represented in actual sensations, such as B, and the *past*, represented in lingering traces or after-images of sensation, such as *a*. Here, then, we shall have the rudiments, at least, of an understanding of succession.

And the explanation thus suggested by the lingering *after-image* of sensations, before they have sunk below the threshold of consciousness, will soon be extended to revived images of sensations, or ideas, raised from beneath the threshold—the events of yesterday, the day before, and so on—and an *abstract notion of time* will at last be formed, as of something containing within it, and making possible, this succession of events.

And this idea of the succession of events may be extended to the future thus. When two impressions A and B, have occurred several times in succession, their ideas become associated in that order. Hence when A recurs in experience, it raises its usual consequent B in idea, *i. e.* as *b*, with the expectation that the shadow *b* will soon take the form of a real experience B, in place of the present one, A. Thus a difference is felt between what *is* and what *will be*, and the idea of succession is extended to the future.

But it is clear that the succession of events in time can be understood only by a *thinking principle which is itself, in some sense, above and independent of time, i. e.* remains permanent and identical with itself, while events change in time.

2. As to the *representation of events in time*.—*Length* or *duration* of time will be understood by conceiving, or trying, to conceive, the "number of experiences which have been, or might be, successively experienced in that time; *i. e.* our idea of each period will be a vague conception of the series of experiences

which it has made, or would make possible to ourselves. Thus, the differences between a second, a minute, and an hour, day, year, century, etc. will consist in the number of successive experiences or events which they make possible. We run over in thought our own experiences of a day, a year, or our whole past lifetime; and by multiplying these in imagination, we can conceive what might be experienced in a thousand years. But as our subjective judgment of time, even for short periods, is vague at best, we help ourselves by the use of *objective* standards, such as the phases of the moon, and the seasons, and such artificial ones as hour-glasses and clocks.

But the above account of time is open, it is to be feared, to the charge brought against the experience theory of extension, *viz.* that it assumes, rather than explains the fundamental notion which it professes to explain,—in this case, the notion of time.

§ 125. *As to substance.*—We have found that the thinking ego, in order to interpret and understand its sensations as qualities, signs, or effects of external substance, must already have the notion of substance to apply to these sensations, and to understand them by. Hence the question of substance is one of the most fundamental and important of both psychology and philosophy. From a purely psychological point of view, the question takes these two forms; *What are the contents* of the idea of substance? and *How is the idea acquired*, or *How does it originate*? And—

(A) *As to the contents of the idea of substance*, this much is obvious—

(a) *That it contains in it the thought of something that is permanent in the midst of change*, or which, while it passes through successive changes of state, mode, or form, yet continues to be essentially the same throughout all these successive states, and sup-

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ports and holds them together (so to speak), and gives them all a certain continuity, connection, and unity; so that they are the successive states of one fundamental reality, which expresses, manifests, and realizes itself in and through them, but remains essentially the same through them all.

Thus, we think of the states as phenomena, or temporary appearances which are always coming and going, and have no independent existence of their own; and of the substance, as something which underlies the changing states, and gives them their existence, order, connection and unity—

(b) And that in thinking of it as a permanent something in the midst of change, we are *thinking of it as of centre of effort, energy, activity.*

For (1) its permanence implies a *continuous effort of self-assertion, or self-preservation* on its own part, to resist and overcome whatever force may act upon it from without, or whatever limitation may be inherent within its own nature—

(2) And the successive states in which it exists are the *effects produced in itself* by its own continual reaction against other things; and the *qualities* which we ascribe to it are its *powers* of reacting and producing effects in other things (the *phenomena* through which it makes itself known to us). And to say that a substance is permanent, is equivalent to saying that, though its states change, its fundamental qualities or powers of reacting on other things remain the same.

Thus in the case of absolute substance. (*i. e.* one not dependent on, nor acted on by any other form of being) its states will consist in activities of *self-development* or *self-realization*. But in the case of finite conditioned, relative things (*i. e.* things, dependent on, and acted on, and limited by other things distinct from themselves) the changes, states, or modes of the thing will result from its continual reactions (or efforts of self-preservation) against the action of other things.

And self-preserving energy.

And, if the thinking principle be a substance in this sense, then *to it*, the qualities of other things will be the different powers which they have to influence it. Its sensations will result from its own reactions against these different external powers—muscle-feeling, being conscious reaction against the motion of solid bodies; colour reaction against the various modes of etherial wave-motion, and so on. And in this way, its sensations become the materials through which it knows other things than itself.

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We conclude, then, that the idea of a substance is, in the last analysis, the idea of *something which is permanent, and has the power of self-preservation and self-development, and is for that reason a permanent centre of energy* (whether as an *ultimate originating source*, assumed in some theories of free will, or merely as a *focus and channel* of force, as assumed in others).

Definition.

§ 126. (B) Next, as to the question, *how the idea of substance is acquired*. We can hardly account for the idea of substance otherwise than by supposing that *we have a direct consciousness of something which is itself substance*. Where, then, have we such a consciousness?

Origin of the idea.

i. It has often been assumed (as found above) that in *external perception* we are directly conscious of *external things as substance, or extra-mental reality*. This is assumed in the realism of popular belief and materialistic thought; as also in the account of perception given by Hamilton and others—*viz.* that in perception we are *immediately* conscious of both self and not-self, as opposed, distinct, and independent realities. But this view can hardly be maintained. For—

Not from external perception.

(i) All that the thinking ego really receives from without—the only means it can have of knowing what is external to itself—are its sensations; or more strictly those effects which it becomes conscious of under the form of sensation. But of all things, sensations are the most fleeting, variable and insubstantial.

(ii) And sensations are affections, states and pro-

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cesses of the ego itself, and not of anything external to mind.

For these reasons it is clear that the thinking principle cannot possibly discover in sensation anything permanent and substantial, distinct from itself; and that in referring sensations to substance, as it does in perception, it must already have obtained the idea of substance from some other source.

But from internal.

2. We must fall back, therefore, upon *internal perception* or *self-consciousness*, and see whether the idea of substance can be derived from this source. Now the conscious life of the ego includes a series of states and activities called sensations, ideas, feelings, and volitions, continuing through a certain period of time. Yet the thinking principle never identifies itself (in mature thought at least) with these states themselves; *i. e.* never thinks of itself as merely the sum or aggregate of the conscious states. On the contrary, it seems to be conscious of them always, not as itself, but as successive states and activities of itself, or processes through which it exercises and manifests itself in time; and therefore to be conscious of itself as a *permanent something which works in and through the series of states*, giving them the connection and unity of a single life, and *remaining essentially the same self throughout all these successive manifestations of itself*.

What self-consciousness reveals about self.

But this is equivalent to saying that the ego is conscious of itself as a *substance*, or something which manifests itself in a series of activities and states in time, while it itself remains permanent or above time (according to the definition given above).

Thus, in every act of feeling, thinking, and willing, it feels the acts and states to be not itself, but *functions* of itself; and itself to be the *subject* or *agent* of them. And it has the power also of reviving past states and acts in memory, bringing them under the notion of time; and in so doing discerns and understands them

to be successive functions of itself in time, and itself to be the common and permanent subject of the series ; and feels itself and its successive states to constitute a single unitary existence.

We must conclude, therefore, *that self-consciousness is the source of the idea of substance*—that the principle which is conscious of thinking, feeling, and willing, is thereby conscious of itself as *a permanent reality which thinks, feels and wills*. And we can now understand how, having thus obtained the idea of a permanent reality, we are able to apply that idea to interpret our sensations, and explain them as *marks, signs, effects* of substance external to ourselves ; and thus arrive at the idea of the external world also as reality or substance, though we can know it only through the sensations which it gives us.

§ 127. Finally, *as to causality and power*. What are the *contents of these ideas*, and how do *these ideas originate* ?

From the above analysis of the idea of substance and its origin, it would seem to follow that self-consciousness is the source of another fundamental idea, *viz. the idea of causality, or power of producing change in other things*, as being contained or implied in that of substance itself.

For in being conscious of itself as a reality or *substance*, the self is at the time conscious of itself as a *permanent seat and centre of energy*, or something manifesting itself in a series of activities and changes of state ; and is conscious of these changes of state as dependent upon the presence of *power* and exercise of *effort* within itself. This is equivalent, however, to saying that it is conscious of itself as *cause*, or something possessing the attribute of *causality, energy, or power of producing change* ; and conscious of exercising that power in

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Therefore self-consciousness gives the idea of substance—the psychological theory.

The idea of cause.

Given in self-consciousness along with that of self.

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the putting forth of *effort and force* for the production of changes; and of certain changes as produced by and dependent upon itself, and therefore as *effects of its own energy*.

Thus self-consciousness gives all the elements contained in the idea of causality. (i) It gives, in the *self*, a real existence which is the seat of *power* to produce change in other things. (ii) In consciousness of *effort*, it gives *energy*, or the putting forth and exercising of power in the form of active *force*. (iii) In the changes which follow upon the exercise of effort, it gives *effects*. (iv) And in the consciousness of the *dependence* of the changes upon the effort, and of that upon the self, it gives the *connection* of effect and cause.

Causality manifested in attention and movement.

Now, though this consciousness of causality will be contained (implicitly at least) in all conscious processes of the self, it will be contained most *explicitly* and distinctly in those mental processes in which the activity of self is most explicit, *viz.* in *volition*; and that in both its *inward* and *outward* applications—in attention and movement. Thus—

(1) In *attention*, the ego is conscious of putting forth effort to determine the direction of its intellectual activities, and thereby the order and connection of its ideas; and is conscious of thereby producing changes or effects within its own ideal sphere; and—

(2) In *movement*, it is conscious of putting forth effort in the peculiar form of muscular exertion, thereby producing *immediately* changes of muscle-feeling, and *mediately* (or through muscle-changes and limb-movements as *means*) changes in the series of sensations imposed from without (which by an act of external perception, it explains to itself as corresponding to changes in the external things which occasion its sensations).

The terms *power*, *energy*, *force*, are not very precisely distinguished in common usage; but, strictly speaking, *power* is the *permanent ability to produce change*, whether exercised or not; *energy* (literally, a working inwardly) is the inward activity or effort which consists in exercising that power or ability; and *force* is thought of as the product of that activity—as if it were something

Power

that passes out into the object, and from one object into another, and produces the change in them.

§ 128. It seems to follow from the above account of causation, however, that the causality of which we are *directly* conscious is only power of determining to some extent the order and succession of our own ideas. We do not seem to be *directly* conscious of a causal relation between ourselves and external things, (for to assume this is to assume that we are *directly* conscious of these things in the same sense as of ourselves); and still less of one between external things among themselves.

How then do we come to think of ourselves as causing changes in external things, and of external things as causing changes in each other? In this way—

Having thus obtained the idea of causality from the consciousness of our own command over our own mental states and processes, we are led, by our perception of the changes going on among external things, to explain these changes by extending to them what we already know of the origin of changes within our own mental sphere; and to think of them also as produced by power, effort, force, analogous to what we are conscious of within ourselves; and thus by analogy to extend our idea of causality to external nature. Thus—

(i) When we are conscious of exerting energy in the form of movement and resistance (known through muscle-feeling), and this exercise of volition or will-effort from within is followed by a change in the sensations imposed from without, (as, *e. g.* the voluntary effort of handling and striking a match is followed by a flash of light); then we explain this change by thinking of our own causal effort or energy as passing out into, and producing the changes in extra-mental things which occasion again these changes of sensation.

(ii) And when we see changes going on in external things independently of our own causal efforts, we ex-

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How the idea of causality is extended to nature.

Things thought according to the analogy of self.

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plain them by supposing *causal energies and forces at work in nature analogous to our own, i. e.* such as, if nature were conscious, would give feelings of effort analogous to those which we are conscious of in ourselves.

Thus we extend to nature, by analogy and inference, the causality which we are directly conscious of only within ourselves.

The logic of
causation.

Now the object of natural science is mainly to discover the causes of things; and by *observing* combinations and processes of things in nature, (or reproducing them by *experiment*), it seeks to ascertain what changes these cause in other things. And the object of *inductive logic* is to determine the conditions under which we are warranted in inferring (from facts of observation and experiment) a *real causal connection* between certain antecedent processes of things, and certain changes in other things, *i. e.* such a connection as we are conscious of between ourselves and our own activities.

But scientific experiment and inductive logic, though they teach us when we are warranted in applying our idea of causation and causal connection to external things, could never give us the idea itself. For all that external observation and experiment can tell us about events is simply that *they follow each other in certain orders*, uniform or otherwise. They do not reveal to us any *essential connection* or dependence between things, but leave them isolated phenomena. The idea of *causal connection* itself must be obtained from another source, *viz. internal perception*.

The successional
theory
of causality.

§ 129. There are *different theories, however, of the origin and contents of the idea of cause, and the belief in causality*. The above *psychological and intuitional theory* of the origin and contents of the idea of cause is rejected by sensationist and materialistic thinkers. Apart from its involving the psychological theory of substance (stated above) which they also reject, these further objections are advanced by Hume and his school—

What we call effort, force, causality, is only a sensation in our mind (*viz. a muscle-feeling*), and therefore only a process, change, or phenomenon like

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No percep-
tion of con-
nection be-
tween events
but only of
their order in
time.

other phenomena; and we are not really conscious of *anything that produces* the so-called effort (*i.e.* of any *self* apart from the sensation), but only of the sensation itself. And the effects which we suppose to be produced by it are themselves only changes or phenomena, known to us as sensations. Now, if we consider rightly, we find that, though we are conscious first of a sensation which we call effort, and then of a change of sensation following it (as the effort of striking the match is followed by the flash of light); yet we are not really conscious of ourselves as producing the sensation of effort, nor of the antecedent sensation of effort as producing the following sensations (of light), but merely of the fact that one is *followed* by the other. And so it is with all other events. We have no consciousness of *production*, but only of *succession*.

Hence, if we think correctly, we find that events are (to us at least) only distinct units appearing one after another; and we know nothing of any connection between them, beyond the mere fact of *their succession in time*. [We do not know of anything *producing* the antecedent, nor of the antecedent's *producing* the consequent; but merely that, *when the one occurs, the other always follows*.] Therefore, whatever we may understand by causality, we must banish from our idea of it all thought of *necessary connection* between cause and effect, and of the *production* of effects by causes.

What then are the contents of the idea, and how does it originate? Hume explains it in this way.—The child finds the event A to be followed by the other event B. Then the idea *a* has a tendency to *become* associated with the idea *b*, so that when A occurs again, the mind of the child has a tendency to pass forward to the idea *b*, by force of suggestion; and this constitutes a tendency to *expect* that A will be followed by B. Now if it so happen that A is followed several times by B in the child's experience, the

Association
of invariable
antecedents
and conse-
quents.

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The cause
only the in-
variable ante-
cedent.

This theory
does not
really explain
the idea of
cause.

association and expectation are strengthened and confirmed. If cases occur in which it is not followed by B, then indeed the association is broken, and the habit of expectation interrupted. But if no exception is met with, then the association between *a* and *b* becomes 'an *inseparable* one, and the expectation that A will be followed by B becomes a confirmed *habit of thought*. And thus the singular proposition, 'A is followed by B,' is raised into the universal proposition, A is always followed by B.'

Now we express this by calling the antecedent event which is always followed by the other event, the *cause*, and the one which always follows it, the *effect*.

According to this view, therefore, the cause of an event will have to be defined as the *antecedent event or combination of events upon which that event always follows*—all thought of production and connection being thus omitted from the definition, and the causality being thought to consist merely in the uniformity of succession between one event and another.

The terms power, force, production, will be of no further use than to express the uniformity of the fact that the same antecedent event is always followed by the same consequent one. In fact we know of no bond of connection between the two events, making it necessary that the one should follow the other; though it has always done so hitherto, so far as our experience goes, still it is possible that exceptions may be met with in the future, so that our belief in cases of causation is always liable to correction. This is sometimes spoken of as the scientific theory of causation, because all that scientific experiment can do, is to show that, as often as we reproduce a particular process, it is always followed by a particular consequent, without exhibiting any connection between them.

But this *phenomenal* or *successional* theory of causation obtains what plausibility it possesses in this way, that instead of explaining the whole idea of causation, it empties out a part of its contents, and explains only the remainder. Thus the cause of an event is indeed the *invariable antecedent* of the event, but this is not the whole, nor the most important part of the idea. If this were all, we should think of

day as the cause of night. But we really think of a cause as a thing or combination of things possessing *power*; and of *causation* as an exercise of *energy*, such as we are directly conscious of in ourselves; and of this energy as passing over into, and *producing* the effect. Hence we do not necessarily think of the invariable antecedent of an event as its cause, *e.g.* of day as the cause of night. And the existence of scientific experimental methods and inductive logic really prove the insufficiency of the successional theory, for the real use of them is to help to distinguish cases of real causation from cases of mere sensation, implying that causation is more than succession.

In other words, invariable sequence, though not itself causation, is the convenient *test* by which we discover the presence of causality, and the chief business of inductive logic is to overcome its defects as a test, and distinguish cases of real causal sequence from accidental ones.

So much for *self*, *substance*, and *causality* psychologically considered, *i. e.* for the sources and contents of the ideas and beliefs as given in consciousness. But the question, what *soul*, *substance*, *force*, are in themselves, apart from their manifestations of themselves in consciousness, are the deepest problems of metaphysics, and lie outside of psychology proper.

But only supplies a criterion for discovering causal connections.

XXVI. ANTICIPATION.

§ 130. The chief purpose of all intellectual work is that we may be able to foresee the future, and thereby be able to prepare ourselves for it—to *avail ourselves* of its opportunities, provide for its wants, avoid its dangers. This requires the processes of reasoning from the past and present to the future, which have been described. It requires also a power of clearly picturing the inferred scenes, events and experiences of the future, in the form of present concrete ideas, so that we may feel them as if they were present. In other words, it supposes that form of constructive imagination which is called *expectation* or *anticipation*, (§ 80, p. 225).

Anticipation of the future, the highest result of intellect.

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This form of construction forms the link, we can see, between logical thought on the one hand and emotion, desire and purposive volition on the other, because it is our anticipation of the future that gives rise to most of our *emotions*, and all our desires or springs of purposive action, and thereby to volition and conduct.

Thus, when a ship-master notices a sudden fall of the barometer, his reasoning powers lead him at once to the conclusion that a storm is approaching, and his imagination at once translates the results of his abstract reasoning into an anticipatory picture of the dangers of the coming storm; and the anticipation raises feelings of fear, and he takes in his sails, and prepares his ship to meet the danger. The failure of the monsoon leads the governor of a province to infer a coming famine, and to picture its miseries by anticipation, and to take measures for relieving the coming scarcity.

Thus we see that thought influences feeling and volition mainly through this form of imagination, and this is therefore the proper place for considering it.

§ 131. Now anticipation is best understood by contrasting it with memory and free imagination. Memory consists, we have found, in reviving or reproducing past experiences of our own in the form of mental representations, accompanied by *recognition*, or the understanding, and belief that these representations *do* represent actual experiences, experienced by ourselves at some point in the series of events constituting our past lives.

Anticipation or expectation, on the other hand, is the *power of forming representations of future experiences of our own, with the understanding and belief that they do represent actual experiences which will be experienced by ourselves* at some point in the future time-scale of our lives, and accompanied commonly by a voluntary process of adapting and preparing ourselves to meet these future events.

And it differs from memory not only (1) in involving reference to future time instead of past, and self-adaptation to the future; but also in this, (2) that it

What is anticipation or expectation?

involves an element of *reconstruction*. For the future never exactly reproduces the past; and hence, in forming representations of the future, we have not only to revive representations from the past, but also, to modify and reconstruct them more or less, to suit future circumstances. And also in this, (3) that it involves an element of *inference*; because we can know or believe that these present representations of ours represent future events, only by inferring from the occurrence of such events in the past, that they will recur under similar circumstances in the future.

Hence expectation may be analysed into the following constituents:—

Analysis of
the expect-
ation-image.

1. There is present in the mind an image or representation involving more or less *reconstruction* of materials supplied by memory. The student's idea of his next examination is not a reproduction merely of any former one, but constructed by rearranging and recombining materials supplied by memory, according to the analogy of former ones. Hence there are here implied (1) processes of memory supplying materials; (2) a process of constructive imagination, rearranging and recombining these materials; and (3) as result of this, an image or pre-presentation of the future event. There is present also—

Imagination.

2. The notion and understanding of *time*, and of the temporal scale of events, past, present and future, and a vague representation of the events of our lives extending from the past, through the present, into the future, and the idea of the self as the permanent subject of them. This is necessary in order to refer the anticipated event to a definite place in future time.

Idea of time.

3. Also the state of mind called *belief*, viz. that this present mental image is an image of something which we shall experience in the future; and this belief

Belief.

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Inference.

supposes an implicit process of inference. For how do we come to *know or believe* that this image represents a future event? There are two sources of knowledge, *viz. perception and inference*. But what is still future, and therefore still non-existent, cannot be *perceived*—it can only be *inferred*. Therefore expectation involves an element of *inference* also, *viz. that, because things once occurred in the past, they must occur under similar conditions in the future, also*. And the inference may be (1) so rapid and automatic that we are not clearly aware of it—such *implicit inference* as is seen in animals, as, *e. g.* when crows start and fly away at the sight of a gun; or (2) it may be *explicit and conscious*, as when we infer, when we see a black cloud coming on, that a storm will follow.

Volition.

4. And finally, there is present also a *volitional element, or effort of will, viz to prepare and adapt ourselves to meet the coming event*; which may be (1) reflex and automatic, as when the crows fly away to escape the expected shot; or (2) voluntary and intentional, as when we seek out a place of shelter from the coming storm.

Thus expectation involves *memory or reproduction* from the past, with an effort of *reconstructive* imagination; the idea of *time*, past and future, and of the series of events filling it, and of the *self* as their permanent subject; *reasoning* or inference from the past to the future, and *belief* founded upon it; and finally *conation or effort* in the form of self-preparation. In fact the chief use of reason (as power of inference) is to foresee, expect, and enable us to prepare ourselves for the future, and the chief use of constructive power is to enable us to represent and conceive the future in order to prepare ourselves for it. And *this foreseeing, picturing and preparing for the future is anticipation*.

PART VII.

THE SECONDARY FEELINGS.

XXVII. FEELING IN GENERAL.

132. Psychologists are agreed that mind has three fundamental functions, which enter into consciousness as its three correlative factors, *viz.* *thinking*, *feeling* (if used in a wide sense to include all the affective states) and *willing*, (taken in its widest sense to include all *effort*, *energy*, or *striving*). Of these, *volition* is doubtless the most fundamental, as the others are in some sense results of the self's continual effort to preserve and perfect itself as self-conscious mind. But on the other hand, *volition* in its distinctly rational and purposive form (moral will) supposes both *feeling* and *thought*—*feeling* of pleasurable or painful states as motive for action, and *thought* of ends and means to guide action in the right direction. Therefore the psychological treatment of *will* comes last. And though feeling in its primary form of *sense-feeling* or *sensation* must precede thought, as being the source from which the latter derives the materials of knowledge; yet in its higher forms of *emotion* and *sentiment* it supposes, and is in fact caused by thought. Hence the most convenient order of treatment is *sensation* and *intellect*, *emotion* and *will*—thus dividing the feelings or affective states into two stages, *viz.*, sensation which precedes, and emotion which follows upon the exercise of thought.* What remains to be treated, therefore, under the head of feeling, is chiefly its higher department, *viz.* *emotion*, together with the general characteristic which feeling

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The three functions of mind and factors of consciousness.

Their logical order.

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What is feeling?

has of being pleasurable and painful—the knowledge-giving elements, *viz.* the presentative sensations, having been treated under cognition.

It is necessary, however, to return to the question, *how the department of feeling is to be delimited or marked off from the other departments of mind*:—for in no part of psychology is there more confusion and inconsistency than in this. Feeling is something which we cannot indeed pretend to define, (1) because it is the most primitive and fundamental form of consciousness (that in which the others are at first implicit, and from which they have to be gradually differentiated); so that (2) its nature is to be *felt*, and every one must feel and experience it for himself; and (3) because words convey only *ideas*, and the idea of a feeling is only the faintest shadow of the feeling itself. Nevertheless if we are to speak of a threefold division of mind, and of feeling as one of the three departments, we ought to be able to *mark off feeling in some way, from the other departments*. Now—

That feeling is pleasure and pain.

I. A common tendency of recent psychology is to *identify feeling* (though in a hesitating and inconsistent way) *with pleasure and pain*—meaning that pleasure-pain is co-extensive with consciousness, and is the essence of that factor of it called *feeling*; and that the different feelings are different modifications of pleasure and pain, varying in kind and degree according to the impressions and ideas out of which they arise.

This *pleasure-pain theory of feeling* has, at least, the merit of simplicity, whether consistent with facts or not. But it is a difficult thing to make one key open so many locks—to make pleasure and pain, which are always essentially the same, explain the all but infinite variety of the shades of feeling. And the theory is generally stated in a hesitating way, as in the following statements: “all psychical states that are distinctly pleasurable or the opposite come under the

head of feelings"—"we have to include under the head of feeling every psychical state so far as it has any agreeable or disagreeable aspect, however slight"—"feeling consists in all varieties of pleasurable and painful consciousness"—statements which leave us uncertain whether feeling be pleasure-pain, or something left undefined, of which pleasure and pain are qualities (and which would therefore be left undistinguished from thought and movement, for we speak of these as pleasurable and painful).

It is difficult, however, to make the pleasure-pain theory agree with our experience of what feeling is—especially if we are to adhere to the threefold division, and to use the term feeling for one of the three essential factors of consciousness. For though all consciousness contains three elements, it is not obvious that all consciousness contains pleasure or pain. These are rather qualities or extreme forms of consciousness. If we are to identify feeling with pleasure and pain, we must use some more comprehensive word, such as *sensibility*, or *affection*, for the third factor of consciousness.

2. Hence if we are to retain the threefold division of mind, we must regard the department here treated of (whether we call it *feeling*, or by some less ambiguous term such as *affection*) as inclusive of *all those forms of consciousness in which mind is comparatively passive, i.e. all consciousness of being affected or acted on, rather than of acting.* In this sense then, feeling or affection will include *all the modes of consciousness which rise directly out of the continual changes of states imposed upon the self by its interaction with the world and the working of its own thought, and which are pleasurable or painful according as the changes of state imposed upon the self are for the better or the worse.* Understood in this way, pleasure and pain will not be assumed to be the essence of consciousness (its primordial and fundamental factor), but either qualities of it, or extreme forms into which it may rise or fall.

That feeling is the consciousness of being acted on—affection.

Taking feeling then in this sense as the *passive* element of consciousness, we are able to understand the

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other two factors thus—

Intellection as the activity by which the self *discriminates, compares* and *interprets* the meaning of its passive impressions, and thereby *understands* its relations to other things, and uses its understanding of the present and past as means of *anticipating* the future; and—

Volition as the continual *effort* of the self to change its relations to things, and adapt itself to the future, so as to avoid harmful and painful states, and attain to beneficial and agreeable ones—guided (at least in its higher, rational and purposive forms) by the understanding of the future which intellect gives.

Different
ways of divi-
ding feeling.

§ 133. Now there are two principal grounds of division according to which the feelings or affective states in the above sense may be divided—according to *their relation to intellect on the one side and volition on the other*; and according to *the way in which they are produced*.

Feeling as
material of
intellect, and
as spring of
action.

I. If we divide them according to their relation to intellect and volition, we have on one side, the *presentative, sensations and elements of sensation*, which touch upon, and amalgamate with intellection, supplying the material out of which knowledge is elaborated; and on the other side, the more *diffused and indefinite affective states* which constitute the *pleasures and pains of sense, the emotions*, and the general feelings of *joy and sorrow, happiness and misery*—giving rise to the desires or springs of action, and thereby determining volition. Thus we have—

Definite and
presentative
elements of
feeling.

(a) The *presentative, intellectual, knowledge-giving* sensations and elements of sensation, or those changing states of the self which correspond most directly with changing states and qualities of external things, and reveal to us the existence of these things with their states and qualities, and *present*, or rather *represent* them to us, in terms of our own consciousness; and thus supply the materials out of which intellect constructs our knowledge of the world. These *presentative elements* of

feeling therefore, will be distinguished from the other forms by these characteristics.—

(1) They are *local* in the sense of being connected with impressions made upon particular organs, as the skin, eye, ear, tongue, and often upon particular parts of the same organ, as points of the skin, retina, and particular end-cells and nerve-fibrils, as touch-bulbs, or retinal rod-and-cone cells—

(2) And for this reason they are *distinct* and various in quality, and degree, and therefore capable of the highest amount of discrimination and comparison—

(3) And therefore correspond distinctly and minutely to the different qualities and parts of the external things which cause them.

(4) And are capable of being brought before, and kept before the mind at any time by the recurrence and persistence of the external things which occasion them; and thereby capable of being observed attentively. And besides these we have—

(b) Those *general and diffused affective states and elements of states*, rising into *pleasure and pain, emotion and sentiment, joy and sadness, liking and aversion* which are not directly connected with impressions on any single organ, but rather with the *general effect which impressions and thoughts produce on the physical and mental system as a whole*. For particular local impressions, and particular ideas (sensations, perceptions, thoughts) would seem to have effects which spread and affect the whole system for better or worse; and this more or less general and collective effect is felt as pleasure or pain, as emotion, as happiness or misery, but does not correspond to anything outside of self.

This so-called *affective element* predominates, therefore, wherever sense-impressions or thought gives rise to a more or less diffused agitation of the whole system which does not correspond directly to, nor represent anything external. These diffused affective states, therefore, will include the *pleasurable and painful elements of sensation or primary feelings, the secondary feelings or emotions and sentiments, and the general feeling of happiness or unhappiness* which, rises out of these.

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Characteristics of presentative sensation.

Diffused and general elements of feeling.

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Feeling, in this narrower sense of physical pleasure and pain and agreeable and disagreeable emotion, is that *element of mind which is most purely subjective, i. e. belongs so intimately to the self, that it cannot be objectified nor thought as a quality of anything else.* Thus we can think of colour, heat, taste, as qualities inherent in things, but pleasure and pain can be conceived only as subjective states of mind.

Now the knowledge-giving elements of affection—the presentative sensations and elements of sensation—have been already considered under Intellection. What remains is to consider the feelings in the narrower sense—the pleasures and pains, emotions and sentiments.

Feelings divided according to the way in they are produced.

II. But apart from the above distinction of two elements—*intellectual* and *affective*—running through them, all the feelings themselves have to be divided into *two classes or stages according to the way in which they are excited,—viz. according as they are excited by impressions from without* (through the organism), or by *processes of thought going on within.* Hence there will be—

Sensations.

1. *Peripherally excited affections*, or the self's consciousness of the changing states imposed upon it from without, by the changing states of the organism, or of extra-organic things affecting it through the medium of the organism. These will include the sensations, which have been described and classified under *intellection*, with the sense-feelings or elements of pleasure and pain accompanying them.

Emotions.

2. *Centrally excited affections, or emotions*,—the self's consciousness of the effects produced upon it by its own operations of thought, *viz.* by the processes of perception, memory, imagination, reasoning, and their products—the ideas and beliefs to which they give rise.

Thus while the sensations precede and give rise to thought, and by their presentative elements supply materials to it, the emotions on the contrary follow and rise out of thought, or out of the effects produced by it upon the organic and mental system as a whole.

For such feelings as fear, anger, pity, hope, disappointment, evidently suppose operations of thought and reasoning, which not only produce feelings, but through the feelings produce also peculiar states of the organism, called the *organic embodiment or expression* of the feeling, which react upon and help to determine the character of the feelings. The study of the feelings will therefore involve the question how they effect the organism, and become mixed up with organic sensation.

§ 134. This question of the *organic embodiment, or expression of the feelings* comes up more especially in connection with the *emotions*, but may be considered in connection with feeling in general.

According to the law of concomitance every mental process has an organic one corresponding to it. But in the case of feeling, the organic concomitants are more extensive and conspicuous than those of representative thought. Thus we know—

(1) That pleasure and pain, hope, fear, anger, disappointment, wonder, and indeed every shade of emotion produces characteristic contractions of the *facial muscles*, which make it possible to read in the *expression of the face* the feelings of the mind. Thus pain, gladness, anger, sorrow, disdain, pity, fear, all the principal emotions, have characteristic facial expressions, which every one readily interprets.

(2) That the stronger ones, at least, produce contractions of the *muscles of the limbs*, and thereby characteristic *attitudes and movements*; and of the *muscles of the chest and vocal organs*, producing *exclamations and outcries*.—Thus sorrow manifests itself not only in a facial expression peculiar to itself, but also, in sighing, sobbing, suffocation, tears and moans.

(3) And besides these outward manifestations which constitute the outward *expressions of the feelings*, we know by experiment that the slightest shades of emotion affect the inward *processes of organic life*—

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The expression of the feelings.

Feelings affect the muscles of the face.

The muscles of the limbs.

The processes of organic life.

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the *heart* and circulation, the *lungs* and processes of respiration, the *liver* and organs of *secretion* and *nutrition*; so that the whole life of the system may be said to ebb and flow with the fluctuations of feeling.

Thus in fear and horror the muscles become relaxed and soft, the limbs tremble, the eyes dilate, the heart palpitates, the face becomes flushed and pale alternately, the organs of secretion become deranged, and cold perspiration covers the skin. In anger there is tension of the muscles producing distortion of the face, clenching of the teeth and fists, compression of the lips, dilation of the nostrils, short rapid movements, raising of the voice, and peculiar conditions of the internal organs and secretions.

Hence the *bodily* processes involved in feeling will be very complicate, and will include at least the following stages:—

(a) In the case of some feelings, there will be the *bodily causes of the feelings*. Thus, in the case of sense-feelings, these will be *impressions* from without on the organs of sense, or changes within the organism itself, propagated to the brain by ingoing currents along *afferent* nerves, producing those affective states which are distinguished as *peripherally* excited, *viz.* the sensations, with their accompaniments of pleasure and pain.

(b) In the case of all feelings alike, there will be the *excitation of the brain-centres*—produced in the case of sense-feelings by the incoming currents from the organs, and in the case of emotion, by the process of thought going on within, and producing some general excitation of the brain (in addition to the activity of the hemispheres concerned in the thought-process itself).

(c) And all feelings alike produce an *overflow of force from the centres by out-carrying nerves*,—for the excitation of feelings does not remain confined to the brain, but overflows by *afferent* nerves into the muscles and internal

Analysis of
the bodily
processes,
accompany-
ing feeling.

Impressions
from without.

Excitation of
the centres.

Overflow of
excitation
into the mus-
cles and vis-
cera.

organs, and produces the organic changes described above—which differ according to the feeling which causes the overflow, and constitute what are called the *expressions* of the feelings.

(d) And finally, these changes in muscles and organs will produce *reflex* or *return currents*—for the changed states of the muscles will report themselves by causing incoming currents by *sensory* nerves to the brain-centres, and thereby producing new effects there; which will mix with and modify the original excitation which caused the outflow.

Hence the combined result will be a very complicated set of brain processes resulting from the intermixture of the original brain excitation (caused by impressions or thought), and the reflux from its effects in the organism, as the sound of an instrument is mixed with and modified by its own returning echo.

The greatest difficulty perhaps with regard to the emotions is to account for the particular embodiment which is characteristic of each emotion, *e.g.* why fear affects a particular set of organs in a particular way, anger another, and so on. The question evidently leads back to the question of the ultimate nature and connection of mind and body.

§ 135. Hence the question arises. *At what point in this series of organic processes does the feeling or emotion itself come in?* And what is the *relation* of the feeling to the bodily processes? And more especially, with regard to the processes called the *expression* of feeling: Does the feeling really *cause* them, as hitherto commonly supposed, or do they *cause the feeling*? With regard to this there are two theories—

1. The older and still generally accepted view is that feeling begins with the original brain excitation (caused by impressions in the case of sense-feelings, and thought in the case of emotion; and that the overflow into the organs is caused by, and depends on the kind and degree of this feeling, and is therefore literally the

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Reflex currents from organs to brain.

Relation of the feeling to the bodily processes.

That the feeling precedes and causes the bodily changes.

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expression or manifestation of the feeling ; and that therefore feeling is merely strengthened and modified by the returning currents from the organism, and not created by them. (These mingle with, and modify the original feeling, because they are in keeping with it ; and they are in keeping with that feeling, because it was the feeling that caused them, so that they are the echoes of itself).

According to this view therefore the order is this :

(i) a process of perception and thought giving rise to central agitation of brain, and thereby directly to emotion proper—fear, anger, hope, etc. ; (ii) an overflow of this central energy producing disturbances of the muscular and vascular systems, caused by and varying with the emotion, and therefore literally its expression ; (iii) return currents from these affected organs, producing organic sensation which mixes with and strengthens the original emotion.

That the
bodily pro-
cesses pre-
cede and
cause the
feeling.

2. But a theory has been advanced recently that the feeling proper does not begin at all until the return currents reach the brain (the fourth of the above-stages). The original excitation and overflow are purely physical and automatic, and not accompanied by feeling at all—it is the incoming currents, reporting the changed states of muscles and organs, that produce the emotion.

This reduces the feelings and emotions to be nothing more than *organic sensations*—forms of sensibility caused by the changing states of the organism, and differing from other organic sensations only in the way in which the organic states which cause them are produced.

The emotions
reduced to or-
ganic sensa-
tions.

The organic states which cause the organic sensations proper are either caused from without, e. g. cuts and burns, or originate within the organs themselves, e.g. in diseases of the organs ; but those which cause the feelings called emotions are excited by processes of thought going on in the mind. Still the outward changes which have been called the expressions of emotion, are not really its expressions (effects), but its causes. "The bodily changes follow directly the perception of the exciting fact, and our feeling of these same changes is the emotion."

✓ The real order in emotion therefore is : first an intellectual process of perception or thought ; then organic disturb-

ances occasioned by the thought ; then the consciousness of these disturbances, which is the emotion. And we are to understand that the thought processes cause an overflow of force by out-carrying nerves in an automatic and mechanical way, without any consciousness ; and that this automatic and unconscious overflow of force produces the changes in the organs ; which again produce in-flowing currents, and thereby the conscious emotion.

This theory that emotions are simply organic sensations is supported by such considerations as these.—(i) If the physical state corresponding to an emotion (its so-called expression) be produced by any merely physical cause, as sometimes happens, then this physical state is itself found sufficient to produce the emotion. Thus the use of stimulants produces joy and courage ; disorders of the liver produce gloom and irritability ; nervous diseases produce despondency and fear. In such cases there is no mental cause, and no overflow from the centres. This proves that emotions can be peripherally excited like sensations ; and are themselves therefore really sensations (*viz.* organic ones).

(ii) And again if the so-called manifestations of feeling be repressed, the emotion itself is suppressed. If we could take away from a terrified person the bodily symptoms of his fear, make his pulse beat calmly, his look steady, his colour fresh, his movements quick and sure, his secretions normal, what, it is asked, would remain over of his fear ? What the mother feels when she grieves for a lost child is really the exhaustion and collapse of her muscles, the cold of her bloodless skin, the brain's enfeeblement and want of power for mental work—accompanied by the consciousness of her loss. But take away these bodily states, and she would have no feeling of sorrow.

This theory of emotion, it may be seen, connects itself easily with a materialistic view of the relation of mind and body. It may be said indeed, that it is the process of thought that produces the bodily states which cause the emotion, thus admitting an action of mind on body. But we know of no action of mind on body which is not through the medium of feeling. The next step, therefore, will be to say that the bodily state which produces emotion is produced mechanically by other bodily states, and that mind is nothing more than a passive product of bodily processes.

Again, it evidently involves the sensationist tendency to regard all consciousness as consciousness of being

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Considerations in support of this view.

Materialist or sensationist.

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Perhaps
neither theory
adequately
represents
the truth.

acted on. But it is safe to say that there can be no awareness of being acted on without awareness of reaction, and that even in emotion there must be a consciousness of expansive energy, of a flux as well as of a reflux of force.

What takes place is probably this.—The process of thought tends to disturb the equilibrium of the system, and there is tension for the moment between the expansive force of the thought, and the equilibrium of the whole. This tension of expansion and repression makes the emotion—before there is any out going current or special organic change. The expansive force upsets the equilibrium of the moment, and produces outgoing currents which produce changes in the organs, and the tendency of the organism as a whole to restore its lost equilibrium gives rise to a new state of tension, which modifies the original feeling and produces at the same time incoming currents.

XXVIII. SENSE-FEELINGS, EMOTIONS AND
SENTIMENTS.

Peripherally
and centrally
excited feel-
ings.

§ 136. We have considered the nature of affection or feeling in its wider sense, as the passive consciousness which rises out of the changing states of the self, and contains in it the possibility of pleasure and pain, joy and sorrow—fluctuating between these extremes according as the states imposed upon the self harmonize or conflict with the essential tendency of the self to preserve and perfect its own existence. And we have found that the feelings include two stages or departments, according as they are excited *peripherally* or *centrally*; and that on one side the affective states border on intellect, and supply materials for knowledge, and on the other, they spread into diffused states of the system as a whole, and give rise to action for bettering the condition of the system, thus passing over into conation. It is with the latter phase of feeling that we have now to deal, *viz.* the more diffused and non-representative sensations and elements of sensation (*peripherally*

excited) the emotions, and sentiments (*centrally excited*), and the *common* feelings of pleasure and pain.

Sense-feelings.

These are the feelings which are excited *peripherally* or by influences from without, whether proceeding from changes of state arising within the organism itself (*organic sensations*) or from impressions made on the organs of sense by extra-organic things (*special sensations*).

But the *presentative* and knowledge-giving elements of the sensations have been treated already under the head of sensation. What remains is merely to notice those more diffused and indefinite sensations and elements of sensation, which are of interest, not as representing external things and therefore as sources of knowledge, but mainly as sources of pleasure and pain. These are what we mean here by *sense-feelings*. The pleasurable and painful elements of sensation are worthy of study because they form a large part of the happiness, and a still larger part, perhaps, of the miseries of life. Their classification will be the same as that of the presentative elements already considered—

1. *Organic sense-feelings*—the pleasurable forms of consciousness arising from the healthy working, and the painful arising from injury or disease of any part of the organism. These will include—

Common organic feeling, or the feeling of general well-being which results from the healthy working, sufficient nutrition, and abundant vitality of the system as a whole; and the corresponding feeling of general weakness and collapse which results from fatigue and exhaustion of the system as a whole.

The feelings of *inanimation*, *hunger*, *thirst* and *appetite* which are only less general than the former—having some vague *local* connection with the organs of nutrition.

And finally, a vast number of feelings which are more or less *localisable* in particular parts of the organism—the painful feelings connected with the defective or

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The pleasure, and pain-giving elements of sense.

The organic pleasures and pains.

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disordered working of internal organs, and only vaguely localizable—the feelings connected with exercise and fatigue of the muscles, and localizable in the limbs—and the pains of cuts, burns, bruises, which are distinctly localizable on the surface of the body.

The question has been raised whether the organic pains, such as those of cuts and burns, are merely qualities or extreme forms of tactual and muscle-sensations, conveyed by the same afferent nerves as these sensations themselves; or are rather *separate sensations, having special nerves of their own*, so that to the other senses and nerves we should have to add a pain-sense and pain-nerves. The argument for this is that certain drugs are found to put an end to pain in a part without putting an end to tactual and muscle-feeling—as if they affected different nerves.

Pleasures
and pains of
the special
senses.

2. The *special sense-feelings*—or pleasurable and painful elements accompanying the exercise of the special senses. These are of less importance than the others as general feeling, because the more the sensations are engaged in supplying definite materials for intellect, the less do they make themselves felt as diffused pleasure or pain. The knowledge which they give, and the pleasure and pain which they directly give are in inverse ratio.

For, as the higher sensations are so largely presentative or knowledge-giving, the pleasures and pains connected with them are largely dependent on the processes of thought rising out of them, and therefore belong to the stage of emotion,—*viz.* the *æsthetic, intellectual* and *moral* feelings, such as the feelings of the beautiful, wonder, admiration, and the like. But there is, nevertheless, a certain amount of purely sensuous pleasure connected with soft and warm touches, and still more with fresh colours and their combinations; and still more with musical sounds and their harmonies. And these pleasures of the higher senses combine with the emotion of the beautiful, and thus enter into the making of *æsthetic* sentiment.

But in the case of the lower senses, on the contrary, taste, smell and touch, their pleasures and pains are purely *sensuous*—sense-feelings and nothing more,—and not far removed from organic ones.

The Emotions.

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§ 137. These are the *centrally* excited feelings—*passive states of mind*, produced not by impressions affecting it from without, but *by operations and products of thought going on within*, i.e. by the ideas and beliefs which thought produces—including such feelings as fear, anger, joy, sorrow, love, hate, wonder, admiration, ambition, envy, reverence, and the sentiments of the true, beautiful, and good. The emotions differ from sensations therefore in this, that they are not *forced on the mind from without*, but rise out of *processes of thought going on within*; so that, though some (such as fear and anger) have become partly instinctive, and are common to animals, most are limited to man; and many (e.g. the sentiments) are possible only to the most highly developed minds.

The centrally excited feelings.

But though in their origin essentially passive, yet being generally the index of some perfection or imperfection of the system, they excite the state of *desire, longing, aspiration*, which, again, results in voluntary action. Thus the emotions are intermediate stages through which mind passes from thought to volition.

Intermediate between thought and volition.

Their *central* and *intellectual* origin may be illustrated by analysis of a low and simple emotion, such as *fear*. Suppose that a person goes out to walk, and that after a time he sees a dark mass rising in the north-west. The *sensation* sets his *understanding* to work, and he *perceives* that it is a cloud. The perception sets him *thinking*, and memory raises ideas in his mind of such clouds experienced before, and of what followed in their train—thunder, wind, rain, and flooded roads—and further consequences which he has himself experienced or heard of, e.g. of being drenched and chilled, of catching cold, fever, rheumatism, and the like. These data set *reasoning* to work, and he *infers* the probability of such a storm, and of similar results to himself, on the present occasion; and the *inference* sets his *imagination* working to picture, with *exaggeration* perhaps, the miseries and dangers which may follow.

Example.

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Now from this train of thoughts there arises the *general affection of mind called fear*. The emotion again, in this case of the fear, prompts one to think out some means of escaping from the threatened danger, and the idea gives rise to desire to realize the idea, and that to voluntary action—*e. g.* to run to a place of shelter. It is a state, therefore, in which mind is affected directly by *the processes and products of its own thoughts*, and only remotely by external things. And so it is with the other emotions. It is true that some of the lower ones, such as fear and anger, have become automatic and instinctive in some cases (the stage of thought being curtailed or eliminated), as when the infant takes fright in the dark, or trembles at sight of a stranger, and as crows take alarm at the sight of a gun; but in most cases, even of fear and anger, their origin in thought is obvious.

Classification
of emotions.

But the emotional states of mind fluctuate so incessantly, and shade into each other so gradually, that it is difficult to discriminate and name them, and consequently to classify them; and no classification that has been proposed is satisfactory. A rough provisional one, however, may be obtained by reference to the *objects of the thought out of which they take their rise*. Now the thought out of which they rise turns either on the *good or ill of individual persons*, or on the *realization of abstract ideas and principles* regarded as good or bad in themselves, apart from particular persons. We thus get—

A. *Personal emotions*, or feelings excited by thinking of what is beneficial or injurious to *particular persons*, and in this sense *concrete and individual*; and these will include—

Self-regarding or egoistic emotions, or those excited by thinking of benefit or injury to one's self, and—

Other-regarding, disinterested or social emotions, or those excited by thinking about the good or ill of other persons rather than ourselves; and—

B. *Non-personal, abstract emotions*, also called the *sentiments*, or the feelings excited by thinking of certain *general ideas or principles, ideals or standards*, and their attainment or non-attainment, fulfilment or violation, in

abstraction largely from all thought of particular persons—the sentiments of *truth, beauty and goodness*.

This order corresponds in the main to the order of development. The earliest to appear will be those which require least exercise of thought and knowledge, and have therefore become more or less automatic and instinctive. The latest will be those which require most personal experience, and thinking and imaginative power. Hence—

§ 138. I. *The self-regarding or egoistic emotions*.—These are the feelings excited in one's mind *by thinking of (i. e. perceiving, inferring, imagining, believing) something which has been, is or will be beneficial or injurious to one's self*, such as fear, anger, hate, hope and disappointment, ambition, envy and revenge, love of power, rank, wealth, and the like :—

• Thus *fear* rises out of a train of ideas leading on to the idea and belief in some future harm and pain to ourselves. This is the simplest and most primitive of the emotions, because inseparable from the fundamental tendency of all living beings to preserve their own existence, and is therefore common to animals and men, and has become to some extent instinctive and innate. It is consequently the first of all the emotions to manifest itself in the child—one observer says after 24 hours.

Anger, hatred, indignation, rise commonly out of the thought of injury inflicted on one's self by another person (though they may also be excited by thinking of injury to other persons, and thereby become disinterested and social). Anger also, being closely connected with the preservative instinct, is an elementary emotion, and to some extent instinctive, manifesting itself after three months, it is said, in the child.

Pride, self-approbation, and the like, from contemplating or imagining some superiority of one's own over others.

Hope, from thinking of some future good to self, and regarding it as probable.

Ambition, from thinking of the satisfaction which would accrue to self from the attainment of power, rank, reputation.

Envy, from representing and contrasting in thought the good fortune and success of others with the ill-success and hard lot of self.

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Self regard-
ing emotions.

Examples.

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Love of wealth, from thinking of the gratification which would accrue to self from the enjoyment of riches.

Prudence, from the perception that the attainment of the greatest advantages to ourselves requires the exercise of self denial, and the suppression of many present desires and inclinations, and the regulation of actions according to rules learnt from past experience.

The last five here mentioned belong of course to a much higher stage of mental development than the first two, because they suppose greater power of thought—of looking before and after, and understanding the circumstances of others and comparing ours with theirs.

Derivative
and com-
pound emo-
tions.

From these elementary emotions there rise many combinations and modifications through association and intermixture. We cannot indeed say that emotions are associated with each other; but the ideas out of which they arise may be associated, and the emotions which rise out of them thereby intermingled and modified, giving rise to new shades of emotion.

Transference
of interest.

They are subject also to the *principle of transference of interest by association*. When a feeling is connected with the attainment of an end, and means have to be used for attaining that end; then it often happens that the feeling which was at first excited by the idea of the end only, becomes so closely associated with the means, that thenceforth *the means is sufficient to excite the feeling without the original end*, and the feeling is thus transferred, as it were, from the original end to the means.

• The most obvious case of this transference of interest is seen in the love of wealth, especially in its extreme form of avarice. Money is desired at first only for the sake of the physical comforts and gratifications which it procures. But the affection is often transferred from the original end to the means, i. e. to the money itself, till the gratification comes to consist, not in the enjoyments for which the money was originally desired, but in the mere possession of the money. This principle of transference of feeling is made much use of by the "associationists," both in psychology and ethics—some even trying to explain *virtue* and *justice* as cases of feel-

ing transferred from end to means. Mill assumed the possibility of a "chemistry of feelings," i. e. that several feelings, at first distinct, may become fused together in such a way as to constitute a new feeling different in kind from either of the originals, as several chemical elements combine to produce a compound different in properties from any of them.

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Chemistry of feeling.

§ 139. II. *The other-regarding, altruistic, or social emotions.*—These are the feelings excited by thinking of *what is beneficial or injurious, pleasurable or painful, to other sensitive beings*. They imply, therefore, a power of entering into other people's minds, thinking how they will think, feeling how they will feel, and sharing in their joys and sorrows. Thus, by making feeling to be common, they join men together in the bond of social fellowship—fusing many minds together (so to speak) in one general mind.

Other-regarding emotions.

Hence social feeling is based on *power of sympathy*, which requires therefore to be further defined and analysed.—*Sympathy* or *fellow-feeling* is the mind's *power of reproducing within itself the feelings of others, and feeling them* (to some extent) *as if they were its own*—thus making the same feeling to be common to many different minds, and producing a tendency in them all to think and act in the same way. Now if we attempt to analyse sympathy, we find that—

Sympathy.

(a) In its simplest form—as seen in children especially, *e.g.* in their tendency to join in the merriment or sorrow of others, and to laugh or weep with them—there is *an element of instinctive and automatic imitation at work*. The child perceives the outward signs and expressions of feeling in others—sees the changes of countenance and movements, and hears the exclamations. In observing and representing in his own mind these outward expressions of others, he automatically assumes the same expressions in himself—the idea of them filling the mind, and directing force into the same muscles, and

Begins with instinctive imitation.

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thus causing the same contractions, instinctively. But the muscular expressions thus assumed automatically bring with them the state of mind of which they are the expression ; and thus, through *automatic imitation of expression*, the emotions of others are reproduced in his own mind.

• Thus sympathy would appear to be, in its simplest form, instinctive in the child from the beginning, as when it weeps at seeing another weeping or pretending to weep, and laughs when another laughs.

But afterwards depends on imagination and thought.

(b) At a later stage, however, it begins to depend less on instinctive imitation, and more and more on *memory*, *inference*, and *imagination*, until at last imitation counts for little in its production. We first *perceive* or *infer* the condition and circumstances of another person. Then we spontaneously remember, perhaps, when we were in a like condition ourselves, and what our own feelings were under the circumstances—our pain or pleasure, joy or sorrow. Or if we have never experienced the same condition ourselves, we can nevertheless construct it approximately in *imagination*, and represent spontaneously in imagination what our feelings would be. At the same time we know by inference that the other person has the same feeling in a stronger degree, because in his case the circumstances are real. Thus we know that our feeling is a weaker reproduction of his. In other words it is *fellow-feeling* or *sympathy*—another person's feeling spontaneously reproduced in our own mind in a fainter form.

• Thus sympathy comes to extend far beyond the range of instinctive imitation—to persons whom we have never seen ; and it does so more especially in the case of feelings which we have ourselves experienced, and can therefore the more easily reproduce ; and of those persons with whom we have ourselves been most closely connected, and whose circumstances we can therefore realize most easily, as parents sympathize most with children, friends with friends, and so on.

Sympathy is the foundation of all the *disinterested* and *social feelings* which prompt men to identify their own interests with those of others, and seek the good of others as their own—such as *parental affection, pity or compassion, philanthropy, friendship, gratitude, patriotism, public spirit*, and the like; and many modifications and compounds of these.

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The Sentiments.

§ 140. III. The *sentiments*, or “*abstract, impersonal* and *disinterested* emotions, arise from thinking of certain abstract ideas considered as *ideals*, or *standards of perfection* (possessing essential value of their own, apart from the interests of particular persons), and of the degree to which *these ideals are realized or violated in particular persons or things*. Sentiment does not therefore exclude the thought of individuals, but concerns itself with individuals not for their own sake, but for the sake of the *abstract ideals or principles which they express or embody*. Certain attributes are felt to be good in themselves and for their own sake, and held up by the mind to itself as ends to be striven after and realized; and the sentiment consists in feeling the inferiority of persons and things to their ideals, longing for the realization of the latter, and delighting in those persons and things in which they are most approximately realized. They differ from other feelings therefore in this, that they have nothing to do with the merely physical needs of life, but are wholly disinterested; that the ideals at which they aim are qualities regarded as *good in themselves*, and not as means towards anything else. The attainment of them produces happiness indeed; but they do so because they are aimed at for their own sake. They are not aimed at because they produce happiness.

The “*im-
personal*” emo-
tions.

In what do
they consist?

Now these higher ideals of the mind are reducible to three—corresponding to three kinds of imperfection,

The “*sen-
timents*,”

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The ideals.

want and longing, and the three ideals of perception which are the antitheses of these, *viz.*—

The *intellectual ideal*, or idea of complete correspondence between thought and reality—the ideal of knowledge—and the longing for its attainment.

The *æsthetic ideal*, or idea of what is beautiful in the surrounding sensible world, and the longing to be surrounded with beautiful things. And

The *volitional or moral ideal*, or idea of a perfect inner nature, disposition, and will, manifesting itself in perfect conduct, and the longing to realize such an ideal in one's own character and life.

These ideals, with the feeling of *want* arising from them, the *longing* to overcome that want, and the *satisfaction* of partially satisfying it, constitute the sentiments. Hence—

The Intellectual Ideal and Sentiment.

The love of truth.

§ 141. In the first place then there is the ideal towards which the intellectual nature strives, *viz. perfect knowledge*. Man as an intellectual being strives to know, *i.e.* to attain a system of ideas within his mind which will correspond to the system of things independent of his mind. Such a correspondence of idea to reality is the ideal at which he aims as an intellectual being.

For we cannot help being impressed with the vastness and complexity of the world, and with the imperfection of our knowledge—the narrow range of our ideas compared with the wide field of truth—and feeling of this limitation of our ideas as an imperfection of our nature; and longing and striving to supply the want.

Hence intellectual sentiment arises from thinking of such an ideal, feeling the imperfection of our actual knowledge, longing to supply the want, and delighting in every forward step towards the attainment of truth.

It follows that the general and fundamental emotion connected with intellect will be the *love of knowledge, truth, wisdom*, with the feeling of satisfaction which accompanies the attainment of truth—the pleasure of discovery. But the fundamental feeling

will become modified in different relations, and yield various subordinate feelings, such as—

Curiosity, or impatient desire to learn about some matter which specially excites our interest—

Wonder, the feeling which arises when we find things to be greater, or more inscrutable than we expected, and we cannot comprehend the cause or reason—

Surprise, when a thing turns out very different from what we expected it to be—

The pride, relief, satisfaction which discovery gives, the feelings of logical *consistency* and contradiction, and so on.

The Æsthetic Ideal and Sentiment of the Beautiful.

§ 142. Further, man lives in the midst of a world of things, which appeal to him through his senses and intelligence.* And he regards the world as not merely a means for supplying his wants; but as something which may be *beautiful and sublime in itself*; forms an *ideal* in his mind of the beauty of things outside and independent of his mind; and delights in whatever things he finds to realize, more or less adequately, his ideal of beauty; and strives to surround himself with beautiful things.

The love
of the
beautiful.

Now this general idea of the beautiful is the *æsthetic ideal or standard of æsthetic taste*, and the emotion arising out of it—the longing for beautiful things, and satisfaction in the contemplation of them—is the *æsthetic sentiment*. And in so far as the craving for beautiful things is not satisfied by nature, it prompts men to satisfy it by artificial constructions of their own; and hence what are called the *fine arts*, (§ 98, p. 263) which are mainly—

* That appealing to the sense of *hearing*, and realizing the beautiful in terms of *sound, viz., music*—

The fine arts.

Those appealing to the *eye*, and realizing the beautiful in terms of *form and colour, viz. architecture, sculpture, painting*—

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That appealing to the power of *mental representation*, and realizing the beautiful in terms of *idea* and *thought*, *vis. poetry*.

And indeed the æsthetic tendency mixes with the practical everywhere. It is not enough that things be useful. People will have them made beautiful also, *e. g.* clothing, implements, vehicles, playthings, weapons—everything in fact must be beautified more or less to satisfy the sentiment.

The science
of æsthetics.

Indeed, the pursuit of the beautiful forms such an important element in the life of all people that the nature of the beautiful has been made a separate department of inquiry called *æsthetics*, which is studied from both a psychological and a philosophical point of view. *Æsthetic* inquiry seeks first by analysis to determine the distinguishing *characteristics of æsthetic feeling*; and from these proceeds to determine those *characteristics of things which cause the emotion*, so as to discover in what the beauty of things—the essence of the beautiful—really consists. The following results arrived at by Kant may be noted here.—

Different
characteris-
tics of æsthe-
tic feeling.

(a) *First as to the characteristics of æsthetic emotion.*—(i) It is a source of *permanent* and *refined enjoyment*; *permanent*, because the things which occasion it are not *consumed* in the enjoyment (like food and drink) but may remain unaltered for ages (*e. g.* a great poem, or building); and *refined*, because it does not exhaust itself in the enjoyment, and pass over into its opposite (pain), 'by producing disagreeable accompaniments and consequents, such as satiety and fatigue.

• In this respect æsthetic enjoyment is essentially different from the gratification of the lower senses; and appeals wholly to the higher senses, hearing and vision, which do not consume their materials nor produce fatigue.

(ii) It is a source of *disinterested* and *immediate enjoyment*, in the sense that it does not arise from the satisfaction of any *physical* want of individuals, nor from the acquisition of *means* to satisfy such want (*e. g.*

money). Beautiful objects are not of *use* for any purpose—not means to any ulterior end. They are valued for their own sake, and as good and desirable in themselves.

• The mathematician who, after reading *Paradise Lost*, expressed doubt about its value, because it did not *prove* anything, was not susceptible of æsthetic feeling.

(iii) It is a source of *universal* enjoyment, in the sense that beautiful things can be enjoyed *universally* and equally by all, because their objects cannot be appropriated and consumed by any individual, *e. g.* the poetry of Shakespeare, the music of Handel.

§ 143. (b) Next as to the attempts to determine what it is in things that constitutes their quality of beauty—the essence or objective nature of the beautiful—these have been less successful; but this much is certain, that—

(i) The beautiful contains what may be called a *material* element, that is, something that appeals to the senses, and can be represented in terms of *concrete imagination*. The higher senses especially, *viz.* vision and hearing, supply materials for æsthetic sentiment.

• For what can be thought only in terms of abstract idea, *e. g.* a mathematical demonstration, appeals only to the scientific faculty. The abstract outline given in a map or diagram is instructive, but a concrete picture is beautiful. A poem may, indeed, contain abstract ideas, but they are embodied in concrete imagery, as soul in body, and this makes them to be poetry and not science. The opposite of poetry indeed is not prose, but science—the latter being purely abstract, while the former expresses its ideas in concrete form.

(ii) It contains what is called a *formal element*, that is the beauty of a thing depends not wholly on its *material* (or power of producing sensation), but also on its *form*, *i. e.* the *order and relation of its parts*; and the beauty of form consists essentially in the congruity and connection of all the parts so as to constitute one harmonious organic whole—giving the beauty of order,

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Constituents
of the beautiful.

Sensuous
element.

Formal element.

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Element of
suggestion.

proportion, symmetry, harmony,—of *many in one, variety in unity*.

* Thus the classical school of poetry made the beauty of the epic and drama to consist mainly in the proportion and symmetry of their parts, the *unity in variety* of the whole. The effect of unity in variety has been explained in this way, that by it the greatest possible amount of agreeable activity is made possible, with the least expenditure of energy. But there is probably a deeper reason for it than this. It is the secret of organization and development, which is the condition of both life and mind.

(iii) It contains also a *suggestive element*, that is, the beauty of a thing does not depend wholly on the sensations which it gives, nor on the proportions of its parts, but partly, and often mainly, on the trains of ideas which it suggests, and the feelings which accompany them, as, *e. g.*, the beauty of words and verses especially consists more in the ideas which they suggest—the trains of memory and vistas of imagination which they open up—than in their harmony of sound.

* Thus the cawing of rooks seems beautiful to many minds, not from any harmony of sound, but because it is associated with the sunshine, warmth and freedom of the spring, and the sports of childhood. The mountain crag, the forest brook, the ivy-covered ruin, “the primrose by a river’s brim,” owe their beauty almost wholly to suggestion.

Alison in his *Essay on Taste* tried to reduce the beauty of things wholly to their power of suggestion. And though this was an exaggeration, for there is something intrinsically beautiful in certain sounds and colours and their harmonies, yet there is no doubt that suggestion is an important element in the higher and more refined kinds of beauty, *e. g.* that of poetry, and especially poetry of the “haunting” kind, as that of Shakespeare and Wordsworth, which stirs the depths of thought and feeling, “making all the chambers of memory give up their dead.”

§ 144. The question of the *ultimate cause* of, or reason why these elements produce æsthetic feeling—

the *ground* of the beautiful—rises from psychology into metaphysic and philosophy. Two lines of explanation have been attempted.—

(i) One school would reduce the feeling of the beautiful wholly to pleasure of sensation. Certain things produce pleasurable sensations. These things with their sensations are associated, reproduced and compounded in various ways in idea; and pleasurable sensations, thus ideally reproduced and compounded, constitute the pleasure of the beautiful. The beauty of things therefore is simply their power of either directly giving, or reviving in idea, pleasurable sensations and trains of sensation. *

* The only difference therefore between the pleasure of a fine poem and that of a peach, is that the latter is a simple and presented sensation, while the former is a multiplicity of pleasant sensations, reproduced and compounded in various ways in idea.

Hence the æsthetic ideal is simply a complex idea of what will gratify the senses—especially the higher ones of sound and vision—to the utmost. And the science of æsthetics consists simply in determining the conditions under which things produce pleasurable sensations of sound and sight, and under which pleasurable sensations may be compounded, revived and enjoyed in idea.

(ii) Another school condemns such explanations as superficial and insufficient. The beautiful appeals to the mind by satisfying the requirement of the rational nature, and rises out of a groundwork of thought. All life and mind strive subconsciously or consciously towards an end, which may be discerned as a good, or a perfection; and to conceive and anticipate a higher good, and guide conduct towards it is reason. Now the beautiful is one aspect of the ultimately good and perfect, and therefore impresses itself upon, and satisfies the mind even without the mind's being able to comprehend clearly why it does so, or in what its perfection consists. It appeals to mind at first subconsciously, and its subconscious agreement with the requirements and aspirations of mind

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The sensationist theory of the beautiful.

The idealist theory.

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produces a conscious feeling of satisfaction, which we call the feeling of the beautiful.

* The philosophy of æsthetics seeks to explain in what this inner harmony and rationality of things consist, and to make it manifest to conscious reason. This account at least recognizes the depth of the question, and does not seek to deceive us with make-believe explanations.

The Sublime.

§ 145. The feelings of the *Sublime* and the *Ludicrous* are also commonly included under æsthetic sentiment.

In the case of the *Sublime*, something is presented in perception or in thought, which by its vastness stimulates the mind to conceive and represent it in idea, but at the same time by its immensity baffles the mind's powers of conception and representation. The result of this is a mixed feeling—pleasurable, but with a painful element.

In the first place, the conception of the object's vastness, so far as it can be represented in thought, fills the mind with an exhilarating and elevating feeling of power, combined with novelty and wonder. But at the same time the immensity of the object, by defeating (as well as exciting) the mind's power of comprehension, raises a feeling of failure, and therefore of the mind's own littleness and weakness, and a feeling also of awe and dread—the "horror of the infinite." And the feeling of the sublime is an intermixture of these feelings of elation and awe—exultation and horror,

* Thus the feeling of sublimity may arise in connection with sense-perception, e.g. the sublimity of natural scenes, or with mere representation in thought, as the sublimity of poetry.

The Ludicrous.

The ground of the *Ludicrous*, or cause of laughter is more difficult to explain. Attempts at explanation have been complicated by over-looking the fact that laughter has different causes. It is often the result of exuberant animal spirits, often of triumph and success—

having nothing to do with anything really ludicrous. The *Ludicrous* properly so-called seems to involve—

• (i) Some person or interest ordinarily invested with superiority and dignity, and therefore imposing awe and restraint; and (ii) a sudden and unexpected degradation of this dignified person, or object, producing sudden and unexpected relief from the awe and restraint which it imposed.

The sudden relief, reaction and rebound, so to speak, from the state of tension and repression produces a feeling of elation, and occasions the overflow of muscular activity which causes laughter. But why the overflow should be into these particular muscles, and produce this particular effect cannot be explained.

The Ethical Ideal and Sentiment of the Good.

§ 146. Finally, man feels himself to be a *rational agent*, and feels that what is deepest and most essential in his nature is what manifests itself, in his conduct or rational action; so that he can fulfil his end, and realize the highest possibilities of his nature only through conduct. Hence he cannot help forming an idea of what is *best in personal conduct*, and therefore in the *disposition* and *character* out of which it springs; and holding this idea up before himself as an *ideal* to be realized in his own life; and feeling that this essential perfection of disposition is *the deepest want of his nature*, so that the attainment of all other ends whatever leaves him still unsatisfied while this one is still wanting. This feeling and longing is *moral sentiment*.

Moral sentiment resembles æsthetic thus far, that the quality which excites it may be described as a kind of beauty exciting an instinctive feeling of love and admiration; but it is a "beauty of soul," which cannot itself be represented in terms of concrete imagination; but manifest itself outwardly in rational action. Hence—

PART VII.
CHAPTER VIII

The love of
the good.

PART. VII.
CHAP. XXIXCharacteris-
tics of moral
sentiment.

(i) It is pre-eminently *an active or practical sentiment* in the double sense (1) that the perfection which excites the sentiment manifests itself outwardly *in action* for the realization of ends; and (2) that the sentiment itself is a *motive force* to the mind that feels it, impelling the mind to realize the ideal in its own nature by a life of action (whereas the feeling of beauty loses itself in passive enjoyment, unless one is an artist).

(ii) It is a *social sentiment* in the sense that moral goodness manifests itself in the reciprocal actions of persons living together in society; and that the sentiment of goodness impels one who feels it to a life of active goodness towards others.

(iii) And it is distinguished more especially by this, that it is accompanied by *the feeling of obligation or duty*. In merely thinking what is good, we feel ourselves to be under an obligation to realize the idea in our own life and conduct, and are oppressed with a sense of guilt if we do not.

The other sentiments do indeed impel us to pursue the truth and surround ourselves with beautiful things, but they do not give any conviction that we are bound to do so.

XXIX. COMMON FEELINGS.

Pleasure and
pain.

§ 147. From the emotions which still have a certain degree of distinctness and can be discriminated and classified, we rise to the most diffused and indefinite form of feeling which we distinguish only as pleasure and pain, joy and sorrow, happiness and misery. No mental phenomena have been more studied of late than pleasure and pain, but it cannot be said that very definite conclusions have as yet been established. The question has been complicated by the loose use of the words pleasure and pain. They have been used indiscriminately for every agreeable and disagreeable state both those rising out of the stimulation of the senses (*physical* pleasure and pain), and those rising out of

the exercise of thought (*emotional* satisfaction or dissatisfaction).

• But there is surely a very great difference between such feelings as, *e. g.*, the pain of a blow and a feeling of disappointment, a headache and grief for a lost friend, the sweetness of a peach and the satisfaction of having resisted a temptation or done my duty. It may be true that the element of agreeableness and disagreeableness common to these states may be ultimately the same in all. It may be true that "what is pain and nothing but pain is essentially the same in all cases and differs only in degree"—that "when I have pain in my teeth or my finger or stomach, when I lose my wife or my situation, if in all these cases we distinguish what is pain and pain alone, and avoid confounding it with perception, idea or thought, then we shall recognize that this special element is identical in all the cases."

Nevertheless we must at the same time recognize the fact that they spring from different sources, and are subject to different laws and conditions; and for both psychological and ethical purposes we should distinguish between two kinds of agreeable and disagreeable feeling—

(i) *Those of physical origin*, which are the pleasures and pains properly so called,—the sense-feelings having their origin in the organism, and arising from *the action of organism on mind*. These have their root probably in the conformity or non-conformity of states of organism, part or whole, with the conditions of life, and the way in which these affect the mind for better or worse.

These are the sense-feelings or pleasure and pains of sense, already described.

(ii) *Those of mental origin*, which have their origin in thought and emotion and involve *the action of mind on organism*. These are the agreeable and disagreeable feelings which accompany emotion and sentiment, and which are not pleasures and pains, strictly so-called, but rather joy and sorrow, happiness, and misery; and have

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Physical and
emotional.

Difference of
origin.

Bodily.

Mental.

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their root in the fulfilment and non-fulfilment of the goods and ends which the mental principle consciously or subconsciously sets before itself. The fulfilments of its desires and aspirations give it satisfaction, joy and happiness, superficial or fundamental according to the aspiration fulfilled; while their frustration gives disappointment, sorrow and misery.

Processes of organism and organic sensations enter into both, and give to both classes a certain identity of *quality*. Yet their origins make them so different that pain of the one kind, is consistent with pleasure of the other, *e.g.* intense physical pain may be accompanied with emotional joy and happiness, and physical pleasure with moral misery.

The physical pleasures and pains.

§ 148. We here deal mainly, however, with the physical pleasures and pains, leaving the emotional ones to ethics; and with regard to these three questions have specially to be considered—the *relation of pleasure and pain to feeling and consciousness in general*; the *laws of pleasure and pain*, or conditions under which they uniformly appear and disappear, rise and fall; and their *ultimate causes or grounds*.

Their relation to feeling in general.

I. As to *the relation of pleasure and pain to feeling and consciousness in general*.—Some think that pleasure-pain is all the original and ultimate form of consciousness out of which other forms (sensation, emotion, thought and will) have been gradually differentiated and developed. But if this were so, we should expect that all consciousness would be divided between these two fields, and be distinctly either pleasurable or painful. But we find on the contrary that pleasure and pain are only occasional phenomena, and that great part of consciousness is not distinctly either the one or the other.

Others think it more probable, therefore, that pleasure and pain are themselves differentiated out of a *more general and fundamental kind of consciousness*, which was originally not distinctly either pleasurable or painful.

The first question, however, is to determine their present relation to other conscious states as mind is at present constituted ; and as to this, three theories are possible :—

1. Some try to show that pleasure and pain are not *qualities* of sensation and feeling, as commonly supposed, but are themselves *distinct sensations*, which may be added on to, or separated from the sensations which they usually accompany. Thus there is a perceptible interval between the feelings of touch and cold which a cutting instrument gives, and the pain of the cut. Smoking tobacco is at first disagreeable, but afterwards becomes pleasurable, though the smell taste and flavour remain the same.

• This apparent separateness of pain from the other sensations has led some to think that pain is not produced through the same nerves as the other sensations, but that there are *special nerves of pain*. In proof of this it is shown that certain drugs take away the one without the other, *e. g. cocaine* and *chloroform* destroy pain, but leave the part still sensitive to touch ; while *saponine* takes away touch but leaves pain—showing that different nerves are affected.

The difficulty of this view is the fact that pain is only occasionally felt, and only in particular parts ; and it is difficult to understand how pain-nerves would have acquired and retained their capacity without continual exercise, such as other nerves require ; and if we assume special pain-nerves we should have to assume special nerves for pleasure also. And besides, even if pain be separable from the special sensations, we may still suppose that it is produced through the nerves of general organic sensation, without assuming special pain-nerves.

2. The view most commonly held seems to be that pleasure and pain are not *independent sensations*, but differential *qualities of sensation*, and indeed of all mental states. In other words, sensations and other mental states are not merely *accompanied* (occasionally) by pleasure and pain, but are themselves pleasurable

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That pain
atleast is a
distinct sens-
ation.

Having spe-
cial nerves of
its own.

That pleasure
and pain are
qualities of
sensation—
tone.

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or painful in *quality*, so that a sensation of touch, taste, smell, etc. may be always *pleasurable* or *painful*, or may be *pleasant* at one degree of stimulation, *neutral* at another, and *painful* at another, without ceasing to be itself, *i. e.* to be touch, taste or smell. Hence they are spoken of as the accompanying *tone* of feelings—as *sensation-tone* and *emotion-tone*. There are no such states as pleasures and pains (by themselves), but other states are pleasurable or painful in quality.

That they
depend on
intensity.

3. And to prove that pleasure and pain must be qualities inherent in the sensation itself, and not distinct and separable from it, it is argued that they depend on the quantity or intensity of the sensation (which again varies with the stimulus, in conformity with Weber's law). Thus when a sense-nerve is stimulated in a moderate and natural degree, the sensation may be at first pleasurable; when the degree is intensified, it loses its pleasurable quality, and becomes nearly neutral (not distinctly either pleasurable or painful), but at this stage attains its greatest *distinctness*, and therefore its greatest value for *representative* purposes and knowledge. As the intensity is further increased it becomes painful; and its painfulness increases with the stimulus up to the limit of sensibility.

* But against this connection between pleasure-pain and intensity of sensation it is pointed out that many sensations are painful from the first and at every degree of intensity, *e. g.* as certain odours and tastes.

Pleasure and
pain as re-
action of the
whole.

And there is this general objection to the *quality theory* that it supposes pleasure-pain to be produced through the same nerves as the special senses—that nerves which give touch, sound and vision also give pain. But against this are the facts mentioned above. It seems more probable that the exercise of the special senses is in itself *neutral*, and that pleasure-pain arise from the *resonance or reaction of the whole system*—that every sensation and activity affect the system as a whole for better or worse, and that pleasure-pain is the consciousness of this general affection, which mixes with the special

sensations, and seems to qualify them—as in sound, the *timbre* mixes with the *ground-tone*, and as in emotion the organic effects return and mix with the fundamental feeling.

We may suppose, then, that the nerves concerned in the production of pleasure-pain are the motor nerves which carry influences from the brain through the whole system, and the organic nerves which report the changes thereby produced in the system, so that physical pleasures and pains will be essentially organic sensations.

The relation of pleasure and pain to each other is also a matter of difficulty. Are they correlative to each other so that pleasure cannot be felt except by contrast to previous pain, nor pain except by contrast with pleasure? Or (what seems more probable) are they relative to neutral states of consciousness, not distinctly either pleasurable or painful? (Some, however, deny that there are any neutral states). Is the normal consciousness pleasurable, or painful, or neutral?

In this connection the theory of pessimism may be mentioned. As consciousness is always a consciousness of being limited, *acted on*, and *repressed*, by the surrounding world, therefore it is *essentially* and *normally* painful, and pleasure is only a temporary relief from pain. Pain is therefore the normal state, and pleasure is only negative and temporary.

§ 149. *As to the laws of pleasure and pain.*—By these we mean not the causes, but *the circumstances and concomitant conditions* under which pleasure and pain uniformly manifest themselves, and increase and decrease. These include :—

1. *The law of stimulation or exercise*—that the stimulation and exercise of every capacity and faculty of the mind, within certain natural limits and degrees, is pleasurable; and that the repression of any one, or its stimulation and exercise beyond its natural limit and degree, is productive of pain. In other words, pleasure is an accompaniment of the stimulation and exercise of every power in its natural degree; and pain, of its repression or over-stimulation,

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Their relation.

Pessimism.

Their laws.

Law of exercise.

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Explanation.

Wundt's
Law.

• This principle implies that every capacity and faculty serves some definite purpose in the economy of mind, so that the energy of mind has a natural tendency to flow into these channels, and its repression produces painful uneasiness; that its exercise therefore in its natural degree supplies some want of the system, and therefore gives satisfaction; while its over-use or abuse produces effects which are painful. Thus what is beneficial and pleasurable is, as Aristotle said, a mean between two extremes, each of which is itself painful.

Wundt has tried to establish the following law experimentally in the case of the sensations:—that the stimulation of every sense, when it rises above the threshold point, is at first agreeable; that the pleasure goes on increasing for a time along with the stimulus, until it reaches a maximum; and then begins to decrease until an "indifference point" is reached, at which the sensation becomes *neutral* (and which is also the point of clearest intellectual discrimination); that as the stimulus goes on increasing in degree, the sensation gradually becomes painful, and its painfulness increases up to a maximum point, beyond which there is no further increase.

But there is this difficulty in the way of Wundt's law, that some kinds of stimulation seem to be essentially painful in all their degrees, *e.g.* discord in sound; so that pleasure-pain would seem to depend on the *quality* of the stimulus as well as on the *quantity*.

Law of
change.

2. *The Law of contrast and change*—that change and variety in kind and degree of stimulation tends to make activity pleasurable, and that the undue prolongation of any stimulus and exercise tends to make it painful. Thus an activity at first pleasurable, when continued too long without change, becomes irksome, and at last painful.

• This may be understood from two reasons. (1) By the *law of relativity*, change and variety of material are necessary to consciousness, so that the thinking principle may be said to be continually engaged in a struggle for variety of material in order to keep up its consciousness. And (2) because the undue prolongation of any activity tends to exhaust the organs concerned; whereas, by continued change of activity,

the work is being continually distributed among fresh cells and fibres, and can go on without producing exhaustion.

This law seems to be limited, however, by another law, *vis.* that of *accommodation*. Certain states, at first disagreeable, when repeated many times at intervals, may gradually cease to be disagreeable, and become indifferent, or even agreeable, the system becoming accommodated to them. And this is but a case of—

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Accommodation.

The law of *habituation*, that *activities* at first difficult, when repeated *frequently*, gradually adapt the system to themselves, so that at last they become easy and agreeable, and their repression often gives rise to a feeling of want and craving.

Habituation.

3. *The law of harmony and discord*, or of the *reciprocal furtherance and hindrance* of mental and organic states.—Some activities (mental and organic) are such as to help each other reciprocally, and thereby to reduce the amount of effort which would otherwise be needed to keep them up. In this way we get the pleasure of increased activity without the burden of increased strain. This reciprocal furtherance of activities is *harmony*, as, *e.g.* the harmonics of colours and sounds.

Law of Harmony and Discord.

On the other hand, they may be such as to conflict with, hinder, and impede each other, so that their simultaneous performance produces an increase of strain and struggle, and requires a painful effort to keep it up. This is *discord*.

Hence the law—that the *multiplication* of harmonious activities tends to be accompanied with an increase of pleasure, and that of discordant ones, with an increase of pain.

• The effects of harmony may be experienced in combinations of sensations of the same sense, as of different colours and sounds; between present impressions and the ideas to which they may give rise, as when a beautiful object revives painful ideas; or between ideas and trains among themselves, as in the case of disagreeable details introduced into a pleasant description, cruel

Examples.

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The ultimate
ground of
pleasure and
pain.

Proportionate
and dispro-
portionate
exercise of
the fund of
vitality.

actions by an otherwise blameless character, obscurities and contradictions in an exposition, and so on.

And they are seen especially in the congruity and symmetry of parts (the *formal* element) which forms a chief element of the beautiful. Thus critics of the classical school thought that the introduction of comic elements into tragedy, as by Shakespeare, violated the principle of harmony.

§ 150. III. As to *the cause of pleasure and pain*.—

We have considered the circumstances under which pleasure and pain arise. The question of their *ultimate cause or reason* is different. With regard to this, there are two main theories :—

I. One theory (given by Aristotle) supposes that man has a certain supply of potential, organic and mental energy at his disposal, and that pleasure and pain depend on the way in which he uses it. This supply of vitality is meant to be used in keeping up all those faculties and activities which are necessary for the development and maintenance of organism and mind. But there are two extremes in the use of it, which have to be avoided—the *disuse* and *waste* of the supply of life, and the *abuse* or *over-use* of it. The perfect life lies in the mean between these extremes, *i. e.* in the proper mean and degree of activity.

Now *pleasure* results from the proper use of the supply of life by the exercise of all the natural powers and faculties in their proper mean and degree, *i. e.* in degrees proportionate to the supply of vitality, and the requirements of life.

Pain, again, results both from the suppression, and from the excessive and disproportionate use of the fund of vital energy, *viz.* by the exercise of powers and capacities beyond their natural proportion and degree, *i. e.* in degrees disproportionate to the supply, and to the real wants of the system.

This theory, then, regards the fund of potential life as *given*, and makes pleasure and pain to consist in *the use and abuse of it*.

2. The theory (stated by Spinoza and adopted by Bain, Spencer and their school) supposes, on the contrary, that the fund of vitality is constantly being increased or diminished with every change of state, and that consequently—

Pleasure is the consciousness of an increase of vitality accompanying some activity and change of state; and *pain*, the consciousness of a decrease. Pleasure therefore is the *result and index of an increase of life*; and what is pleasure-giving is also vitalizing or life-giving for the time being. Pain is the *consequence and index of a decrease*; and what is painful lowers the supply of life for the time being. Pleasure is a rising to fuller life; pain, a sinking towards death.

This view, therefore makes the fund of life to be variable, and pleasure and pain to consist in its increase and decrease.

There are, it is admitted, many apparent exceptions to this principle; e. g. pleasure often seems to be for the time being a *passive state of enjoyment*, rather than an increase of activity, as in repose whereas pain *produces violent activity* for a time; and this seems contrary to the theory. Nevertheless, Spencer argues, if pleasure had not coincided in the main with what is vitalizing, the development of living beings would have been impossible. For all creatures naturally seek what is pleasurable, and avoid what is painful. Hence, if what is pleasurable had been injurious, and what is painful had been beneficial to life, creatures would have brought about their own destruction, and life would have become extinct.

The question, however, belongs more to philosophy than to psychology

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Increase and decrease of the fund of vitality.

Spencer's argument.

PART VIII.

CONATION.

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Recapitulation—three functions of mind and factors of consciousness.

XXX. THE PSYCHOLOGY OF WILL.

§ 151. We have found that mind includes three fundamental functions which appear as three essential factors of consciousness, *vis.*—

Sensibility, which is the self's capacity of being passively affected, or of having changes occasioned in it by other things and by its own activities, which manifest themselves as sensations and emotions, pleasures and pains—

Intellection, which is the self's faculty of discriminating, interpreting, understanding these passive impressions, so as to make them means and materials for the knowledge of the things which occasion them, thus turning its impressions of present things into conceptions of present, past and future things. And—

Conation, or *volition*, which is its power of reaction upon the things which occasion its affections or changes of state, so as to change the things, and thereby change its own states for the better, and thus preserve and perfect itself—the activity of self-development and self-preservation.

We have still to consider the last of these functions.

Meaning of conation.

Conation, therefore, or *will* in its widest sense, is the putting forth of energy, or exercising of effort on the part of the self (under influence of feeling) for producing changes either in the direction of its own thought, or in external things, so as to adapt itself

to things, or things to itself, and thereby to preserve itself, supply its own wants, and perfect its own nature.

• This conation manifests itself in consciousness most clearly in the peculiar feeling of *trying*, *striving*, or *putting forth of effort*, which we experience when we do any kind of work, or produce any kind of change; and which is so strongly contrasted with the feeling of *passivity*, or of being acted on, which we experience when we have any change produced in us without co-operation of our will (e.g. in sensation). In fact these opposite forms of consciousness, even when combined in one compound whole (as in lifting or pushing), are the most distinctly contrasted in our nature, and form the basis of the distinction between self and not-self, mind and external world. Hence volition, or the power of conscious reaction for self-preservation and self-realization, may be said to be the essence of the self as a *substantial* reality—something, which permanently asserts and preserves its own identity by reaction against other things.

It may be objected, however, that will in its highest forms becomes almost abstracted from exercise of effort. When I will to-day to do something to-morrow, there is, it may be said, no striving or effort accompanying the volition. Yes. There is (i) the effort to adapt the whole system, by anticipation, to a particular line of action, and to exclude rival ideas and inclinations, and (ii) there is the anticipation of future effort, involving memory of past.

§ 152. Conation or conscious reaction, again, operates in two different ways, which may be regarded however as only two different stages in its development—

(a) It may operate *automatically* or *impulsively*, i.e. the energy of action may flow forth in obedience to an impulse from within or from outside, without any foresight or idea beforehand of the effect to be produced, or of the means of producing it, and therefore without any purpose or intention—even though the action be performed consciously, and have its origin in a state of pleasure or pain.

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Active and
passive con-
sciousness.

Conation
divided ac-
cording to
mode of
operation.

Automatic
conation—
pre-volition-
al.

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Purposive
conation—
volition proper.

• This is therefore automatic, impulsive non-purposive action. It prevails in animals throughout their lives, and in human beings at the beginning of life. It appears under different circumstances as *spontaneous*, *reflex*, and *instinctive* action. In man it is soon supplemented, and to a large extent superseded, by another form of action, which some regard as a development out of the former, but others, as essentially different in kind. For—

(b) It may operate *intentionally* or *purposively*, i. e. the energy of action may be put forth with an idea beforehand of the end to be attained and of the means of attaining it, and with the desire and intention of attaining it. It will in this case be *ideo-motor*, purposive or intentional; and only action thus guided by idea, desire and intention can be called *voluntary action* or *conduct* (action regulated by reason) in the strict sense of the word; because it is only in action of this kind that *free will* manifests itself, and it is only for it that persons can be held *responsible*.

* Thus the word *will* is used in a wider and in a narrower sense. In the wider sense, it is used to include all conscious conation or striving; and it is so used when we speak of will as one of the three ultimate functions of mind. In the narrower sense, it stands for purposive or intentional action to attain a foreseen and desired end; and it is in this narrower sense of conduct, or rationally controlled action, that it is used in Ethics.

Conation divided according to its application.

§ 153. But, again, both automatic and purposive action have to be divided according to still another principle. The effort may be restricted within the circle of mind itself, and limited to producing effects or changes there; or it may overflow into movements to produce changes in the external world. In other words, conation may take the form of—

(a) *Intellectual effort*, or effort to produce changes within the contents of consciousness, by regulating the intensity and direction of the intellectual activities of

discrimination and thought—stimulating, sustaining and concentrating them upon particular sensations and ideas, in order to discriminate these more clearly, interpret and understand them better, and fix, retain, and revive them better—thereby modifying also the feelings connected with the sensations and ideas, and thus the whole contents of mind more or less.

• This application of will-effort to modify directly the contents of consciousness is commonly called *attention*, because it is accomplished by *attending* to, or exerting the thinking power upon, one object of thought to the exclusion of others.

That there is such a thing as purely subjective effort in this sense is obvious when we concentrate our thought, e. g., on a visual object (properly on its sensation) and try to make out (from the sensation) what its shape, size, and distance are; or upon an idea or set of ideas, and try to determine what other ideas or relations are implied in them (e. g. in a problem of any kind). But instead of thus confining itself within the sphere of mind, conation may overflow into—

(b) *Physical effort*, or *effort of movement*, which is energy taking the form of out-going currents to contract the muscles, move the limbs, and produce changes in external things, and thereby indirectly in the sensations and feelings which they occasion in the self—promoting agreeable and preventing disagreeable ones.

Thus both forms of energy may be said to have mental changes for their object, directly or indirectly—intellectual activity being a striving to produce such changes *directly* by regulation of thought; and motor activity, to produce them *indirectly* by first producing changes in external things, which again react upon mind.

Both intellectual and motor efforts, again, may operate either *automatically*, without any consciousness of end or purpose; or *purposively* and *intentionally*, with an idea and desire beforehand of the change to be attained.

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CHAP. XXX.

Applied to intellectual work—in intellectual conation.

Applied to physical work—motor conation.

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CHAP. XXXI.

But the two forms are not in any way opposed to each other, because even the action which passes over into physical movements begins as a concentration of mental energy upon the idea of an end, and of the series of movements needed to realize it. In fact, will as such, knows nothing of body nor of external things, but only of ideas, and their realization through concentration of effort.

Hence two kinds of conation or volitional action have to be considered, *vis. Intellectual Conation* or *Attention*, and *Motor Conation* or *Movement* of different kinds.

XXXI. INTELLECTUAL CONATION.

Attention.

§ 154. By *intellectual conation*, or *attention*, is meant *effort of will turned back into the sphere of mind itself, and applied directly to intensify and sustain the intellectual activities of discrimination and thought*, and concentrate these activities upon particular sensations and ideas, so as to discriminate and understand them better, to impress them more deeply on the mind, and retain and revive them better in idea, and thus build them into the permanent structure of knowledge; while, at the same time, by changing the direction of thought and the trains of ideas, it indirectly modifies the other functions of mind also, *vis. emotion* and *volition*, which depend on ideas.

Examples.

Thus, we are conscious of such application of effort to thinking in the act of *perception*, when we try to discriminate one shade of sensation from another, and understand from it the form, size, and distance of its objective ground, or to identify a taste, or smell or sound; in *memory*, when we try to recall a lost fact or word by effort of recollection; in *imagination*, when we try to contrive something new and different from anything hitherto experienced; and in *abstract thought*, when we try to solve a problem, or follow out a line of reasoning.

Thinking is not indeed the same thing as willing, but as all three functions of mind are reciprocally dependent, so thinking requires to be sustained at every moment by volition, whether automatic or purposive, and this application of volition is attention. Its opposite is the state of mental distraction or indifference, in which thought wanders about at random without fixing itself on anything.

The *characteristic marks of attention* are therefore (1) that it is a form of conation or effort; 2) that it is turned not outwards to move the limbs and overcome external obstacles, but inwards to sustain the activities of discriminating, perceiving, remembering, imagining and thinking (though organic processes are involved even in this); (3) that the *objects* upon which it is turned are therefore the objects of intellection, *viz.* sensations and ideas; (4) that the *purposes* for which it is turned on them is to discriminate, understand, and remember them better, and through them to influence the course of feeling and volition; and (5) that the means by which it does so is by concentrating the available power of mind in one particular process, and upon one particular object, thereby fixing and retaining it longer, in the field of consciousness, making it more clear and distinct, and impressing the traces of it more deeply on the mental and cerebral system.

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Differential
characters.

§ 155. We have to consider then (I) the different purposes to which attention is applied, (II) the different ways in which it is applied to them, and (III) organic accompaniments of attention.

I. *As to the applications and uses of attentive conation.*—These may be classified and considered under three heads—(A) its use as a *transferring* and *fixing* force, (B) as a *discriminating* and *integrating* force, giving *analytic* and *synthetic* intention, and (C) as a *pre-adjusting* or, *preparing* force, giving *expectant* attention
Thus—

The uses of
attention.

(A) In the first place, then, attention has the double function of *fixing* the discriminating activity of intellect, and *keeping it fixed*, upon some one selected object of

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For concentration of thought.

thought, and of *transferring* it, when required, from one to another. Thus—

(1) *It is a concentrating and fixing force.*—Effort is required to fix thought, and more especially to keep it fixed upon a particular object. For other ideas are always rising into consciousness from *within* by force of association or similarity; and external stimuli are always forcing themselves on the mind from *without*; and these ideas and external stimuli are always tending to *scatter, disperse, diffuse* the intellectual activity among themselves, or to attract and concentrate it upon some one of themselves in the *reflex* way. Hence effort is needed to counteract these distracting tendencies.

• But this effort is fatiguing and cannot be kept up continuously without variations of degree. Hence attention, even when fixed on the same object, is subject to alternate *oscillations* in respect of degree, as if the effort could not be kept up without intervals of partial rest. Thus the sound of a waterfall and the tickings of a clock seem to rise and fall as we listen to them, even when the rising and falling is not in the objective sound, but rather in our own attention and consciousness.

For transferring thought.

(2) *It is a transferring force.*—Being fatigued with, or having exhausted a particular object, or having a stronger motive for considering another, the thinking self by effort of will transfers its activity of thought to another object, and concentrates it upon that—as being of fresher interest, or as exercising the activity through fresher nerves and cells, and therefore more agreeably.

• Hence the *fixation* or *transference* of attention will be determined partly by the *freshness* or *fatigue* of the nerves concerned, and partly by the *interest* or *feeling* which the new object excites in the mind. And transference of attention from one thing to another will be *easier* (1) when the things are *connected* with each other in *kind* (similarity); or (2) are already *associated* with each other in experience and idea, so that there are ready-made channels, so to speak, for the mental activity to flow from the one to the other.

But on the other hand, when things are *different* in kind, *greater effort* will be required to transfer the attention, because the transference will require a re-adjustment of the whole attitude of mind,—even though it may be aided by greater freshness and interest, of the new field.

(B) Again, *it is applied to the work of differentiating and reintegrating the materials of thought*, which enters into all the processes of intellect—taking them asunder (in thought) into their elementary constituents, discerning their relations, and putting them together again in orders and connections corresponding to the orders and connections of the things in nature. To be able to do this is equivalent, we have found, to knowing and understanding things. And this result cannot be attained without prolonged conation or effort in the form of attention.

Sensations and feelings first present themselves to the mind in a vague and comparatively homogeneous mass of consciousness, which, before it can become material of thought, has to be *analysed* or *differentiated* into its constituent elements and relations; and these, again, have to be *interpreted*, and *connected together* in thought into an orderly system of ideas—a systematic unity in thought, of what is at first a confused and bewildering plurality in experience. These two processes form the very essence of thought, and are accomplished by effort of attention operating in two opposite ways—

1. By *analytical effort*—by which it concentrates the activity of mind upon one point after another, of the at first vague expanse of consciousness, and by intensifying the consciousness of these points enables it to distinguish differences of quality, degree, form, duration, and different positions in time and space.

This focussing of the mental activity upon particular parts of a complex may be called *the discriminating* or *analytical use of attention*, because it proceeds

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For differentiation and integration.

Analytical attention.

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by resolving the compound into its elements, and examining its elements one by one. It will be accomplished with least effort in the case of things made up of units which are *locally* separate in space, like the trees and buildings in a landscape or picture; or *temporally* separate, like successive events; because in such cases *muscular exertion* can be brought to the assistance of purely intellectual effort, and applied to adjust the observing organs upon one point after another. It is most difficult when the elements to be discriminated are neither *spatially* nor *temporally* distinct, as in the case of voices and instruments sounding simultaneously.

Synthetic
attention.

2. By *integrative effort*—for knowledge supposes not only that experience can be differentiated into units, but also that these units can be connected together in thought into wholes or ideas of things, and these into higher wholes, classes or systems, corresponding to the order and connections of real things, and finally organized into a connected conception of the world as a whole.

Hence the *analysing* effort of attention must be accompanied or followed everywhere by an *integrating* effort, which strives to grasp the connections, relations, and essences underlying the plurality of experiences, and thereby to connect these heterogeneous experiences together in thought, and think of them as things, classes and systems. This, then, may be called the *synthetic or integrating use of attention*.

* This synthesis of qualities and parts into things (in thought), and of things into classes, takes place most easily when they manifest themselves through sensations of the same sense, (as in an arrangement of colours, or a harmony of sounds). Thus, the colours and forms of a flower, a building, a landscape, or picture, are more easily grasped together under attention for this reason, that they manifest themselves through the connected optical and muscular sensibilities of the eye. To integrate sounds with movements, smells, or tastes is much more difficult.

The number of things that can be brought together under attention without losing their distinctness, (*i.e.* can be included under discriminative and synthetic attention simultaneously), is of course very limited. Experiment shows that four or five small and familiar objects can be grasped; and a larger number, if they be arranged symmetrically, as in a triangle or circle. Beyond this narrow limit, *synthetic* attention becomes inconsistent with *discrimination*, and has to resort to *abstraction*, *i.e.* to omitting details, and including only essence or form.

C. Finally, it is applied also to the work of adjusting beforehand the intellectual activity and general state of mind to what is going to happen, producing the attitude of mind peculiar to *expectation*.

This pre-adjustment of mind is necessary to the observation of experiences which come and pass rapidly. For the adjustment of attention requires time: thus (1) in *reflex* attention, time is required for the ingoing currents to reach the centres and produce the evolution of energy which concentrates intellectual activity, and adjusts the organs of sense upon the outward cause; and (2) in *voluntary* attention, time is required for thought and resolution, as well as for the process of adjustment. Hence, in the case of rapidly passing experiences, there could be no attentive observation or understanding if the intellectual power could not be adjusted beforehand to receive them by *expectant attention*.

And the advantage of this pre-adjustment of mind and organs is that it shortens the time required by the mind to react upon, and become clearly conscious of the new object, when it comes suddenly before the mind (known in psycho-physical experiment as *reaction-time*), and retain a mental image of it when it passes rapidly away again. And the facility with which the mind can thus adapt itself beforehand to observe and comprehend a new experience will depend on its own freshness and vigour for the time being, and its freedom from pre-occupation with other objects of attention.

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For adjustment of mind and body.

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CHAP. XXXI.Reflex ex-
ercise of at-
tention.

§ 156. II. *As to the way in which conative energy is applied to these uses.*—This takes place in either of two ways—in a *reflex* and *automatic* way, or in a *purposive* and *voluntary* way—and according to these two *modes of application* attention may be divided into two kinds, *reflex* and *purposive*.

I. Attention may be said to be *reflex* or *automatic*, when an *external object* or *event* acting on the mind through the sense-organs and in-going currents, or an *idea of memory* springing up from within the mind itself, *produces* an impression of itself so deep and strong as to take possession of the field of consciousness for the time being, and stimulate the intellectual activities, and draw and concentrate them upon itself, to the temporary exclusion of everything else,—and does so without any exercise of will or intention on the part of the ego itself, or even in spite of its desire and will.

*Examples.

• Attention thus excited, and concentrated may be called *automatic* or *reflex*, because the impression or idea stimulates, absorbs, and draws upon itself the mental activity without any intervening process of thought and choice. Thus, a flash of light in the darkness, a burst of music, an interesting sight or amusing remark, anything new, strange, or surprising from without, or the idea of a lost friend rising suddenly from within, or that of some task, trial, or difficulty which we have to overcome, will excite and draw the thinking activity to itself, and keep it fixed for a time upon itself, without any co-operation of our will, and often in spite of our will, (as when we are distracted from our studies in spite of ourselves by sights, sounds or recollections, and are unable to resist their distracting force).

Its intensity.

And as to the *force with which attention is thus excited and kept concentrated in this automatic way*,—(1) the stimulating and concentrating effect of an impression from without will depend largely on the *force or intensity of the sensation*, as when a flash of light, or the report of a gun, draws the attention automatically to itself; but (2) in many cases of external impression, and all cases of idea, the exciting stimulus is *pleasurable or pain-*

ful feeling, as e. g. the idea of a lost friend excites the feeling of sorrow, a beautiful picture excites pleasurable æsthetic feeling, the sight of suffering excites compassion, and so on; so that the degree of the attention excited by the idea or impression will depend upon the *degree of feeling or interest which it excites*.

2. Attention is *purposive or voluntary* in the strict sense when the concentrating energy is evolved and applied by an *effort of will*, as a means towards the attainment of a *foreseen and desired end or purpose*; so that a process of *thought, desire, choice and volition* (as well as mere passive feeling or interest) intervenes between the idea or impression (which is the occasion of the attention) and the attention itself.

Hence, to be voluntary, attention involves (1) an end or purpose present in idea, and the desire of realizing it; (2) a belief that that end can be attained only through observation and understanding of a particular object; and (3) voluntary choice and effort to exercise and concentrate the powers of the mind to obtain that knowledge and understanding, as a means towards the desired end. Thus, if we desire to pass an examination, and know that the mastery of certain books is necessary as a means towards that end, then by an effort of will we put forth energy to concentrate all the powers of our mind upon these books, and to exclude other objects from our thoughts for the time being.

Now in voluntary attention, the degree of the attention will depend on the *strength of will* exercised; and that again will depend on the strength of the *desire* felt for the attainment of the end towards which the attention, and the knowledge which it seeks, are means.

But in many cases the means themselves, the knowledge and the mental activity needed to obtain the end, are desirable in themselves, (e. g. the study of a science as a means of passing an examination may itself be a source of gratification and pleasure); and in such cases the interest of the means will add itself to, and re-inforce the desire of the end proper in a reflex way, and thereby strengthen the attention.

§ 157. III. *As to the organic accompaniments of attention*.—It has been found that every mental process has

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Purposive
exercise of
attention.

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conditions.

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Function of
the organism
in attention

a *physical process* of the organism corresponding to it. It might indeed be supposed that mind can control its own operations without any co-operation of body; but close observation shows that attention is no exception to the law of concomitance. What, then can be known of the *organic processes corresponding to attention*?

Attention being a form of effort, exertion, activity, its physical concomitant will be a process of the *active* or *motor* region of the brain, from which muscular movements also proceed; and intellectual effort will, in its source, be closely connected with muscular effort. Hence, we might expect to find attentional effort in all its forms to be accompanied by more or less innervation and muscular effort, tension, and movement; and so it is, for—

(a) In the case of attention to the sensations which external things occasion in us, we find that there is always—

(1). Exertion and tension of the muscles of the *organs of sense*, and to some extent of the rest of the body, in order to adjust the organ to the sense.

• Thus, in observing an object visually, we have to exert the muscles of the body and neck to bring the eyes to bear upon the object, the external muscles of the eyeballs to make their axes converge upon it, and the internal ciliary muscles to focus the lenses to the distance; and a continuous effort of all these muscles is needed to maintain continuous attention to the thing.

(2) While at the same time another class of muscular efforts are needed to *inhibit* or restrain all other movements which would *interfere* with the adjustment of the body and organs of sense to the object of attention—in other words, *exertions of inhibition*.

(3) And not only so, but along with these there are always certain *concomitant movements of expression* which are characteristic of attention; of which some may be *instinctive*, such as movements of the mouth and features in attending to things, and some may be *acquired habits*,

In attention
to things.

such as the practice of shutting the eyes, or pursing the lips, when listening.

Hence the consciousness of attending to external things will be mixed up with the consciousness of these muscular tensions and movements.

(b) But even in the case of attending to *ideas of the mind*, there are always feelings of concomitant muscular tension. Thus—

(1) When we fix our attention on an idea derived from vision, or from touch, we find that there is always a straining and adjusting of the muscles of the eye or hand, as in actual experience—

(2) We find also that we have to make the same exertions of inhibition, to exclude disturbing movements, as in the case of objective attention—

(3) There are always *concomitant movements* of expression also, such as hanging down the head, checking the breath, expressions of the features, etc.—

(4) And finally, there is, we know, increased molecular activity of the brain-cells and fibres of both the motor and the sensory centres, as is proved by the increased oxidation and consumption of blood, and the increased evolution of heat and elimination of waste products.

* These physical concomitants, then, leave no doubt that even purely volitional and intellectual processes have physical processes corresponding to them.

Thus I see a passer-by on the street, who for some reason excites my interest, and thereby rouses my attention. The energy of attention at once suppresses all the other impressions and thoughts which filled my mind the moment before, but intensifies the impression of the passer-by, and the thoughts which the sight of him suggests. In order to retain and stimulate these thoughts I look after him, and strain my ciliary and other ocular muscles, and the muscles of the neck and limbs; while the face assumes a particular expression, and there is a flow of blood to the brain to feed the intensified processes of thought. And at the same time the other senses, e. g. hearing, are practically closed, to exclude all dis-

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In attention to ideas.

Example.

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Are the bodily processes the effects, or the means of attention ?

tracting impressions. Thus not only the whole mind, but the whole body also, is adapted to the dominating thought.

What then is the relation between attention and its physical concomitants? This question has an important bearing on the question of the relation between mind and body. It may be understood in either of two ways—

(i) It may be supposed that the bodily changes are only *consequences* of the mental changes, and have nothing to do with the making of them:—that the energy of the self thrown into the direction of its own mental activities overflows also into the physical organs, and produces changes and adjustments in these—as the emotions overflow and produce the organic changes which we call their expression.

(ii) Or it may be maintained that the organic processes in attention are the *means* through which the self regulates its own mental ones. In this case, we should have to assume that all energy of conation flows first into the organism, and can affect mind itself only by being reflected back from organism to mind again ; and that mind uses organism as means of producing changes not only in external things but also in itself.

XXXII. MOTOR CONATION—PRIMITIVE.

Pre-volitional conation—automatic.

§ 158. We have found that *conation* (or volition in the widest sense) passes through several stages of development, and that *volition* in the narrowest and strictest sense is the highest and latest of these stages. The lower and pre-volitional stages may be roughly described as *impulsive* or *automatic*, because not prompted and guided by conscious thought, (idea, desire, intention, purpose). The most complex and important of these *primitive* stages is instinctive action, which in many respects anticipates and simulates, or does the work of rational volition, without being volition proper. But

there are other still more primitive stages which precede and prepare the way for instinct, and have to be considered along with it.

By automatic action, then, we here mean conscious action which springs out of feeling and is adapted indeed to produce beneficial results, but is performed without any idea beforehand either of the results to which it is adapted, or of the means of attaining them, so that the adaptation itself is unconscious and unintentional. The energy of the action flows forth into out-carrying nerves, produces contractions of muscles and movements of limbs, and thereby changes in external things and their relations; which again react on, and produce changes in the state of organism and mind which are mostly beneficial (giving some relief or gratification); and yet the whole is done without the guidance of conscious idea or intention.

* The peculiarity, therefore, of such processes is—that the series of nerve-currents, muscular contractions, and movements form chains of means adapted to produce some beneficial result to the organism and mind of the creature; but that this is accomplished without any knowledge beforehand of either means or result, and therefore without any co-operation of reason or will (in the higher sense) on the part of the creature.

But in dealing with automatic movements we have to distinguish between such as are really *psychical* or *mental*, and such as are merely *organic*—belonging to the bodily life, and not rising into the sphere of mind at all. Thus, (1) there are automatic actions of purely organic origin, which do not rise into consciousness at all, such as the movements of the heart and other internal organs. (2) There are others, again, which produce effects which rise into consciousness as passive organic sensations (e.g. the disorderly working of any organ), but are of purely organic origin. Neither of these kinds of movement will be *psychically initiated*, therefore, nor come within the sphere of mental conation.

(3) But there are others, again, which, though performed automatically in the sense of being without conscious end or purpose, have their *spring* or *source* nevertheless in a conscious mental state of agreeable

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or disagreeable feeling, prompting to action for its own relief or continuance. Such actions, therefore, though automatic, are *psychically originated* (*sensory-motor*, or prompted by sensation); and must therefore be regarded as coming under the head of psychical conation, or volition in its widest sense.

Three
classes.

Now these primitive automatic actions may be conveniently divided into three classes, *spontaneous*, *reflex* and *instinctive* properly so called. To these a fourth class may be added as *secondarily automatic*, *viz. habits* which, though automatic, are *secondarily* so, *viz.* in the sense that they do not like the others precede voluntary action in order of development, but follow upon, and are acquired by means of it. The movements in which the feelings express themselves might be added—*movements of expression*—but these must be derived from some of those already mentioned.

These may be considered, therefore, under the following three heads:—

Spontaneous.

§ 159. I. *Spontaneous actions* are those impulsive and irregular movements which arise, in young creatures especially, by *an accumulation and spontaneous overflow of energy, without either the guidance of idea and intention from within, or the excitation of any stimulating force from without.*

Thus, in young creatures especially, and to some extent in all, energy accumulates of itself in the motor centres, and, as long as it is unused and repressed, gives rise to a feeling of uneasiness; and this feeling, resulting from the accumulation of repressed energy, operates as an impulse to its discharge in the form of out-going nerve currents and movements. These movements give both the satisfaction of *relief*, and the positive pleasure of muscular exercise, and these feelings further stimulate and prolong the movements for a time.

But this overflow is not prompted nor guided by any idea of the end to be attained, or means of attaining it. What direction, then, will it take? Apparently the lines of least resistance. These will obviously be the out-carrying nerves and muscles which are most frequently needed and used in the creature's lifetime, and which are therefore the first to be developed and matured into working order. And these are, we know, the nerves and muscles concerned in the production of sounds, and of movements of the limbs. Hence this primitive and spontaneous overflow of accumulated energy takes place mainly by the nerves and muscles of voice and movement. Thus the cries and impulsive movements of the infant and young animal are not prompted by the idea and desire of any future end to be attained, in which case they would be *voluntary*; nor (in many cases at least) by any stimulating force from without, in which case they would be *reflex*. They are a spontaneous overflow of accumulated force from within, prompted by the feeling of organic uneasiness arising from unused and repressed energy. They are *sensori-motor* therefore, and thus far *psychical*, but not *ideo-motor*—prompted by sensation (in this case organic), not by idea and desire.

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Sensori-
motor.

• The characteristics of such movements, therefore, are (1) that they are manifestations of *psychical conation* in the sense of being psychically initiated or prompted by feeling; and (2) that they are adapted to *results which are beneficial* to the system. (The beneficial results, in this case, are not merely the relief and pleasure of exercise, but more especially the healthy development of the nerves and muscles. It is by these at first random movements, that the infant gradually acquires the use of its muscles and limbs, and that the way is prepared, not only for the more complex movements of instinct, but also for voluntary movement proper). And yet (3) they are without any idea, intention, or prevision of

Characteris-
tics.

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these results, as in voluntary action proper; and (4) result from a spontaneous overflow without any stimulation from without, such as characterizes the next class, *viz.* that of *reflex* actions. And the same tendency to accumulation and spontaneous overflow of energy may continue through life (though repressed and guided by will), and constitutes the *active temperament*.

Movements
of expression.

To this class of spontaneous actions may be referred also *the muscle-contractions and movements by which the emotions express themselves*, as the outcries and movements of pleasure, pain, fear, anger, and the like. And indeed many of the actions here described may be understood as the expression of feeling—of the creature's joy or pain—for expressive movements, whatever their origin, have come to be a spontaneous overflow of accumulated energy by lines of least resistance.

Reflex.

§ 160. II. *Reflex actions are impulsive movements occasioned by an overflow of force and contraction of muscles, which is stimulated directly by sensations from without.* An external force (or some sudden change in the organism itself) acts on the ends of sensory nerves, and causes an inward current to the centres; and this produces a shock of sensation, and is immediately followed by an out-going current by motor nerves; and this produces movement of the limbs to escape from (or perhaps prolong) the stimulation, but without any explicit idea, desire or intention of so doing. Thus, when we accidentally bring the hand against a sharp point or a hot glass, we withdraw it again with a spasmodic start, without having any time for thought or intention. There is an out-going current followed by a sharp sensation of pain, and this is followed again automatically by an outgoing current, a contraction of muscles, and movement of the limb.

Analogy of
light.

• Such movements have been called *reflex*, as appearing to have some analogy to the reflexion of light. As the ray of light is reflected from a polish surface, so it seems as if the force of the incoming nerve-current

from the organs to the centres were immediately reflected back again from the centres into the organs. The analogy, to be sure, is only a vague one, because the incoming force (1) has to pass through a complicate system of ganglionic cells, and in doing so (2) gives rise to sensation, and (3) becomes greatly intensified in quantity, (for we find that a very slight stimulus from without may produce a very violent reaction, whereas light rather loses part of its intensity in being reflected).

The *characteristics therefore of reflex actions* are that (1) they are excited by a stimulus from without, which (2) produces an incoming current and thereby a sensation, and (3) the sensation is at once followed by an outgoing current and movement; and that (4) the action is automatic in the sense that, though adapted to a special and beneficial result, it is nevertheless without any prevision or intention of the result. Between the stimulus and the reaction there is time for sensation, but not for thought. They are *sensori-motor*, but not *ideo-motor*.

But not all the actions which are reflex in a physiological sense are accompanied or prompted by sensation, and can therefore be called psychical conation. In fact, the whole of the processes of organic life—the beating of the heart, the action of the arteries in keeping up the flow of the blood, of the lungs in breathing, the stomach in digesting, the liver, skin and other organs in secreting—are kept up in the *reflex way*, i.e. by an alternate, or continuous and simultaneous, inflow and outflow of stimulating and reacting force. But most of these processes proceed unconsciously; and the number of really *sensori-motor* and *psychical* reflexes is comparatively small. They include the frequent movements of starting at any sudden and acute sensation such as tickling, pricking, burning; and those of sneezing and coughing, winking, turning to the light, automatic attention, and some others. The movements of automatic imitation also may be brought under this head; and to some extent also the movements of emotional expression, though it may be doubted whether these are spontaneous or reflex (reflex in the sense of being

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Characteristics.

Organic and psychical reflexes.

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Instinctive.

stimulated and guided by sensations, or spontaneous in the sense of being the expansion and overflow of energy evolved by the emotion).

§ 161. III. *Instinct*, again, is the power, and the tendency or inclination, to perform a long and complicate series of actions adapted as means to produce a definite future result which is essential to preservation either of the individual itself, or of its race, prompted probably by a feeling of uneasiness from within, but without any explicit idea, or knowledge beforehand, of that result. Instinctive action, in short, is the performance of a connected series of means co-ordinated and adapted to a future, and it may be, a long future end, which lies outside the individual's present field of consciousness, and which it may not even live to see.

• The bird builds a nest to shelter young ones and protect them from enemies of which it as yet knows nothing, and migrates over seas to escape from winter of which it may yet have had no experience. The spider builds its house, and spins its net to catch victims of which it knows nothing beforehand, with cunning which appears to rival reason. Ants and bees store up food against winter which they have never experienced, and so on.

How instinctive differs from reflex action.

Hence instinctive and reflex actions differ in these points :—(1) the typical reflex is a simple momentary act, while instinctive action is a complex series ; (2) reflex action is prompted by a present impression from without, instinctive, by a feeling of uneasiness rising from within, and not connected with any present external cause or circumstance ; (3) reflex action, therefore, is adapted to remedy merely a present annoyance, of the individual, while instinctive action is adapted to a future and perhaps distant end, and often to circumstances beyond the lifetime of the individual which performs it, as, *e.g.* the insect makes elaborate preparations for the comfort and support of offspring which will not be hatched until after its own death.

• Hence, though in the lower stages there may be no very clear line of demarcation between reflex and instinctive action (as in the case of the young mammal sucking immediately after birth, the young bird picking up grains as soon as out of the egg-shell); yet, the higher forms of instinct rise in complexity of adaptation far above the reflex stage, and rival the achievement of conscious reason itself.

From volition proper, again, instinct differs in this way.—The instinctive series begins indeed, like the voluntary, with a feeling of want and uneasiness; but in volition the feeling of wants suggests ⁽¹⁾ the *idea* of something which will supply the want, and excites the state of *desire* for the realization of that idea; and at the same time suggests (from personal experience) ⁽²⁾ ideas of the *means* or series of movements by which that idea may be realized, and prompts the self to deliberate about, and resolve upon its realization; while the ideas of the means guide its energies to the right movements needed for realizing it. Thus, in volition, the *end is present from the beginning, viz. as idea*, and prompts and guides the self to the selection and combination of means for its own realization.

In instinct, on the contrary, these intervening conscious stages between the impulse or spring of the action and its final completion—*viz. the ideas of end and means, desire, deliberation, resolution*—are wanting. It performs the action and attains the result without any prevision of either means or result.

• The characteristic marks of instinct are therefore these:—

(1) Its physical spring of action would seem to be a vague feeling of want and uneasiness springing up within, and not prompted directly by any external stimulus. The want may be a want of what is needful for the preservation of the creature itself, as in the case of the spider constructing its web, the bees their hive, the beaver its dam; but in many cases it is a want of what is needful for the preservation of its offspring and species.

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explain the
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after its own death. • Indeed the most remarkable instincts have reference to the preservation of the species. The want *felt* by the individual is a want not so much *of the individual*, as of *the race or species which lives, feels and works (so to speak) in the individual, and makes the individual the means of its own preservation*. The individual is, thus far, not an end to itself, but only a means to the existence and preservation of its race.

(2) The energy of relief, generated by the uneasy feeling, flows of itself into the right channels, and produces the right movements, and continues to do so for a length of time, producing a long series of movements of many different kinds, but all unerringly adapted and combined as means to the ultimate end; and yet the whole is done without foresight of means or end.

The creature may indeed be to some extent prompted to the selection of means by sense-impressions operating in the reflex way, e. g. the warmth of spring, the sight of sticks and straws and of a favourable locality, may prompt and guide a bird to some extent, in the reflex way, to the building of its nest; but this does not dispense with the instinctive tendency itself, because there are innumerable other sense-impressions acting on the creature besides these. Instinctive action cannot be explained away, therefore, as merely a series of reflex actions.

(3) And both the power of performing and the tendency to perform the series of actions is present in the creature from the beginning of life—showing that they are not acquired by example, imitation and habit, but are, in some sense, innate, and therefore inherited from ancestors along with the organism.

Some have indeed tried to explain away instincts by trying to show that they are only habits, which the creature rapidly acquires by observing and automatically imitating its parents. But this explanation is now abandoned.

§ 162. Thus the mystery of instinct may be said to consist in these questions:—(1) How has the feeling of want itself originated, which gives the original impulse to the series of actions? In many cases it can be understood as arising out of a state of the organism, as in instinctive action for procuring food and shelter. But

it is in many cases difficult to understand how the states of organism themselves have arisen, as when creatures act for ends lying outside of their own lifetime, providing for circumstances which will not occur until after their own death.

(2) And still more, How has the feeling of want come to be connected with the long and varied series of movements, and the many and various means and materials needed to realize such distant ends, so as to produce these movements, and attain the ends?

In the case of voluntary action the end itself is present as conscious idea, and as such, guides the self to the right means for its own realization; but in instinct the guiding idea is wanting.

Many attempts have been made to explain these combinations of means to end but none of them is satisfactory. The most important attempt may be stated thus:—

Instinct is "lapsed intelligence," or hereditary habits which have been acquired mainly by exercise of intelligence, but have become automatic and hereditary by repetition. Creatures in the course of ages gradually learnt such combinations of actions, partly by chance, but partly by contrivance (intelligence); and, being once discovered and found beneficial, the series of actions were repeated again and again, until they became automatic which were gradually registered in the structure of brain habits, and organism, and handed down by inheritance, accumulating and becoming more perfect from generation to generation, until they attained their present perfection. Creatures which failed to acquire such self-preservative habits failed thereby in the struggle for existence, and became extinct, and only those kinds survived in which they became hereditary and connate, *viz.* as instincts.

Theory of
hereditary
habit.

This theory supposes that the combinations of instinct were first discovered either by chance or by intelligent contrivance, or partly by the one and partly by

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Origin of instincts inseparable from that of organs

the other. But it is inconceivable that such complex combinations should ever have been discovered by chance; and it is very improbable that insects, birds and beasts can ever have possessed more contriving and combining intelligence than they do now.

And further it should be borne in mind that instinctive actions for special ends are but the natural use and application of organs with which the creature is provided; so that the question, how they come to perform these actions, is really identical with the question, how they came to be provided with these organs. The question of the origin of instinct therefore extends far back to the very beginning of life and organization.

It is evident then that, to explain instinct, we should have to be able to go back to the very beginning of life, and be able to explain the essential nature of life and mind itself. "There is something in the curious and benignant operation of instinct such, that whosoever studies it and does not believe in God, will not be convinced by Moses and the prophets."

Habits.

§ 163. IV. *Habit or secondarily-automatic action*—differs from the other automatic forms in this that, while they constitute the primitive and pre-volitional stages of conation, preparing the way for intelligent rational will, *habit is itself a product of rational will; and consists in the automatic performance of actions which were at first performed with the contrivance and guidance of intelligence and will.*

Their origin in voluntary action.

Thus, a combination of movements has at first perhaps to be intelligently *contrived* as a means to an end; and can be repeated in proper order and connection only by effort of attention and intelligent deliberation. But after many repetitions the centres, nerves and muscles become so modified and adapted to these movements by the accumulation of traces, that the performance of the action becomes easier, and needs less attention and effort. At last, after a sufficient number of repetitions, it comes to be performed *mechani-*

By repetition.

cally, without thought or even consciousness. Whenever the same circumstances recur, energy flows forth spontaneously into the proper nerves and muscles, and produces the proper contractions in their proper order and connection, without requiring any further guidance of thought, or effort of will. Then the action is said to be performed from *habit*. Thus walking, speaking, writing involve complicate combinations of movements which require at first many trials, and prolonged effort of attention, but at last become automatic and almost unconscious. And so it is with riding, swimming, drawing, and all kinds of muscular dexterity.

*The first step in habit is to acquire *ideas* of the different movements needed, and associate them together in their proper order. The next, to establish connections between the ideas of the movements and the movements themselves (because there is more in the movements than enters into the ideas of them), so that the movements may follow at once upon their ideas. The final step is to connect the movements, together by themselves, in such a way that one will follow another in the proper order, without any further guidance of idea; until at last even the ideas become superfluous, and the whole complicate process becomes at last mechanical, and thought is left free for other work.

And indeed there is reason to believe that, when a series of actions thus becomes habitual and automatic, the incoming currents which stimulate it, cease to rise to the cerebrum (the centre of intelligence), and pass through the cerebellum. In other words, the prompting force from without which keeps up the action makes a "short cut" (so to speak) from the incarrying to the outcarrying nerves, by crossing from the one set to the other through the cells of the cerebellum, leaving those of the higher centres free for other work.

From this we can understand the use and importance of Habit in the economy of mind. When the lower physical and mental processes have once been acquired, organized and consolidated into habits

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Accommodation.

And association.

Uses of habit.

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so as to be performed more or less automatically, then mind itself is left free for higher work, and new acquisitions. Thus habit is essential to mental progress and development, leading to modification and development of *intellectual, emotional and moral character*.

✧ It is possible however for mind to identify itself so completely with habit of action and thought (manners, customs and beliefs) already acquired, as to be unable ever to rise above them. In such cases, habit proves not beneficial, but fatal to progress. Thus it is customary to point to the Chinese as a whole nation bound so fast in the fetters of habit, that further progress has become impossible to them.

XXXII. MOTOR CONATION—PURPOSIVE.

Characteristics of voluntary action,

§ 164. *Voluntary action* is, like instinct, adapted to the realizing of an end at some time in the future, but with this difference, that the future end is present from the beginning in the form of *idea*, and the *idea suggests to thought the means* for its own realization, and the ideas of the means and end together guide the self to the performance of the action; so that the whole action is performed, not by blind impulse, but knowingly and intelligently, with prevision and free choice of means and ends.

Its successive phases.

Now every voluntary action may be said to pass through three stages or phases of development, from its first *inception* in the mind to its *completion* in external results, *viz.*—

✧ (1) *A mental stage*, or stage of mental inception and preparation, before it manifests itself outside the circle of consciousness—

(2) *A stage of organic work and muscular movement*, in which the accumulated energy, prompted by desire and guided by *idea*, overflows into out-carrying

nerves, and produces the needed movements of limbs and body; and—

(3) *A stage of completion or realisation* in the form of results, including the changes produced by the movements on external things, and the changes produced again by these on the mind of the agent, and other minds. This is the stage most difficult to describe fully because the results or effects of actions differ for every action, and are practically endless—for a single act may change the whole history of the world. Now each of these successive stage of the action requires special analysis. Hence—

§ 165. I. *As to the preliminary mental stage of inception and preparation.*—This includes several steps, of which the following must be distinguished:—

1. *The spring of action.*—Every psychical action has its source in a want, need, or imperfection which makes itself felt in a *feeling of uneasiness*. Without wants to be supplied there would be no motive for action of any kind. But a finite being, living in limitations and conditions, is living in continual want, and its life therefore is continual action to overcome these wants, and to preserve and perfect its own existence.

• Now the wants of human nature, and therefore its springs of action, range from the wants of the organic life, which express themselves in appetites, up to the more purely mental wants expressed in the intellectual, æsthetic and moral sentiments. And as wants and the satisfaction of wants express themselves in agreeable and disagreeable feelings, and all the feelings arise out of wants and the satisfaction of them, and are therefore agreeable or disagreeable, a classification of the wants or springs of action will correspond in the main to a classification of the feelings.

2. *The end and motive.*—In instinct, want operates blindly without consciousness of means or ends; but a rational being soon learns to understand what is needed

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Analysis of
the mental
phase.

The mental
spring.

The events.

The idea or
end.

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to supply his wants, and the means of attaining that something, and the satisfaction which would follow from its attainment. Hence the *idea* of the object needed to satisfy a want and of the satisfaction which it would give becomes to the mind a *motive force*, prompting it to act for the attainment of that object and satisfaction, and thus raising the object into an *end* of action. Every voluntary action, therefore, has a *motive* and *end*.

• The *end* will be the object or the change of state needed to relieve the want; the *motive* may be said to be the *idea* of that change or object, which prompts to desire of, and guides the person to the attainment of the object.

Thus if we distinguish between spring of action and motive, the former will mean the impulse to activity in general, the latter will be what guides the activity into a *particular* channel, and makes it to be a *definite* action, *vis.* the idea of a definite end to be attained, and desire of attaining it.

Desire and
motive.

3. *The state of desire.*—Thus the idea of the object and the satisfaction which it will give (the motive, it may be called) does not pass into action directly, but excites first the state of mind called *desire*, or yearning for the attainment of the end, which may be said to be a state of *incipient activity*. Desire is, therefore a complex mental state, supposing *the feeling of want*, the *idea* of what is needed to satisfy the want and, in addition to these, the peculiar *state of craving* and straining towards activity for the realization of the idea. (The term *motive* is rather loosely used for either the idea which excites the desire, or the desire which excites to action. Each is, in its own way, a *motive*, or moving force).

Relation of
desire to self.

• It is not to be supposed, however, that the desire forces itself upon the self without its own co-operation, as often assumed. The function of the self as a rational being is to judge for itself *what it wants really are* (what is really needed for the preservation

and perfect development of its own nature), and what is best adapted to supply its wants; and thereby to determine, in a sense, what its desires and motives shall be. (The prevailing sensationist philosophy, however, makes mind to be the aggregate of ideas, feelings, and desires, interacting among each other spontaneously, without any controlling self).

4. *Conflict of motives, deliberation*.—There are always a plurality of wants calling for satisfaction, and therefore a plurality of possible ends and desires. Now something like a competition or conflict arises between the different possible ends, motives, or desires in this way:—(1) ends can be realized only one by one, and therefore successively; whence the realizing of one necessitates the postponement of others; and frequently one requires so much time and labour that it makes others to be postponed for a long time; and (2) ends are often so incompatible with each other that the realizing of one excludes altogether that of another, so that, of two alternatives, only one can ever be realized. Hence the question is continually before the mind: with which of several alternative ends or motives shall it identify itself for the time being? This condition is often described as a *conflict of motives*, as if motives or desires were independent forces struggling against, and overcoming each other. It is rather a state of *deliberation* or reflection, in which the thinking self, by raising and reviewing in thought all the means and consequences of the alternative actions, discovers at last which of them is intrinsically the most desirable, *i.e.* the most needful and most conducive to its own highest good.

Thus the self, in so far as it has realized its own potential rationality, really makes and unmakes its own desires. It is true, however, that this rational self-command is realized in very different degrees in different minds; and most are liable to be "carried away" more or less by their desires—in that case called *passions*.

Rivalry of desires.

Deliberation.

Passions.

PART VIII.
CHAP. XXXIII"Fixed
ideas."

* And there are cases also of action from the influence of "fixed ideas." Ideas sometimes lay hold of the mind with such power as to reduce all other ideas to subjection to themselves, and to determine emotion, and thereby work themselves out in action spontaneously. Such fixed ideas predominate in morbid states of mind, but all are subject to them more or less, as, e.g. in panics, the idea of coming danger or a pursuing enemy. In cases of passion and fixed idea, therefore, there is no plurality and no conflict of motives—one idea and feeling usurping the whole mind for the time being.

The act of
willing.

5. *Determination, choice, volition proper.*—The stage of deliberation is followed by the final act of determination on the part of the deliberating self—by which it concentrates itself wholly on, and identifies itself for the time being with what it finds to be the most truly desirable of the alternative ends, with its means and consequences. This self-concentration of the self upon one idea and line of action for the time being is the volition proper. It is commonly spoken of as an *act of choice*. The self is said to *choose freely* between the alternative desires or motives. (This would imply, however, that the motives or desires are things presented to the self from without, as if existing independently of it. The form of expression may be accepted as a convenient metaphor, but not as literally true. Desires are 'not external forces, but rise from within the self; and the self *makes* them, rather than chooses between them).

Described as
choice between
alternatives

In determining the end to be desired and realized, it *consents* at the same time to the *means* which may be necessary to the realization of it, and to the foreseen *accompaniments* and *consequences* of its realization. These, along with the end itself, constitute the *intention*.

The motor
phase of
action.

II. *As to the stage of physical movements and means.*—The final concentration of the attention and energy of the self upon the idea of a particular end and the means of realizing it, is followed by an overflow of the concentrated energy by outcarrying nerves into the

muscles and limbs, producing the contractions and movements necessary as means for realizing the end.

• For the production of the right movements or means supposes ideas beforehand of the movements needed, which must have been acquired gradually in the course of previous experiences; and supposes that a connection has already been established between the ideas and the movements, so close that the latter follow automatically on the former by force of habit.

III. *As to the final completion of the action in the results produced by the movements.*—Every rational action aims at the attainment of an end, present from the beginning as idea; and the realization of the idea or attainment of the end is the object of desire, or that for the sake of which the action is performed. But the results of the action are not limited to the realization of the desired end. It produces many other effects, *viz.* as collateral accompaniments and ulterior consequences. Some of these have been foreseen, and, though not *desired*, have been assented to and *intended*, as being inseparable from the desired result. Others have not been foreseen, and therefore not intended.

• Hence the results in which the action completes itself will include—

(1) The *realized end*, or object of desire, for the attainment of which the action was designed and performed. Actions, indeed, are not always successful, *i. e.* the end aimed at is not always attained; but generally it is so more or less.

(2) The necessary accompaniments and consequences of the desired result, which were not desired indeed for their own sake, but accepted merely because the desired end could not be attained without them. Hence they are *intended*, but not *desired*. The *intention*, therefore, is wider than the *desire*—including the *means* used and the *foreseen results*,

(3) Accompaniments and ulterior consequences which were not foreseen, and were therefore neither desired nor intended, *e. g.* *accidental results*. Practical wisdom consists mainly in foreseeing the results of actions so as to leave as little as possible to accident;

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CHAPTER III.

The completion of the action—objective results.

Analysis of results.

Intended results.

The intention.

Unintended results.

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but their results are really infinite, and no one can foresee them all.

Origin of
volition.

§ 166. The question now arises as to *the relation of this power of voluntary action to the earlier and pre-volitional kinds described above*. The actions of the infant are wholly of the primitive kinds—spontaneous, reflex, instinctive—and volitional action in the strict sense appears later. How, then, does it originate? Does it imply the sudden springing up of a new and original power in the mind, independent of the earlier and lower forms of action? Or is it developed by a continuous change out of these earlier forms?

Experiential
account of its
development.

Some have attempted to explain voluntary action as developed from the primitive forms of action in this way:—

Spontaneous
actions lead-
ing to plea-
surable
results.

(1) The child's first movements are of the spontaneous reflex and instinctive kinds. But these automatic actions produce pleasurable or painful results. Now, when an automatic action produces by chance a painful result, the pain represses the action; but when it produces a pleasurable one, then the pleasure stimulates to the prolongation and repetition of the action automatically; and hence both the action and the results leave traces of themselves in idea; and these traces of the results become associated and connected with those of the action which produced them.

Association
of results and
movements
in idea.

(2) Thus associations are gradually formed between the ideas of actions and those of their results. Hence, when at another time the idea of a pleasurable result is revived, it revives along with it the idea of the action or movements which produced it; and the idea and desire of the absent pleasure stimulates the repetition of the movements, (according to the law that pleasure promotes while pain depresses action), and thus leads to a renewal of this pleasurable experience.

Here, then, we have the beginning of *ideo-motor* action, (or action prompted by the *idea* of a future end and satisfaction), and therefore the beginning of volition.

(3) Then, in the course of experience, the ideas of possible *goods* or *ends* to be attained become more explicit and varied, and the actions leading up to them become more complicate, but at the same time more closely associated with each other by repetition and habit, so as to follow upon their guiding ideas (ends) and prompting desires with all but automatic rapidity and regularity.

• Present and temporary goods or ends come also to be distinguished from, and subordinated to future and permanent goods—proximate ends to be sought as means to ultimate ones. And in proportion as this organization of means and ends is perfected by habit, conduct becomes more fully *rational or volitional* in the strictest sense, and life more fully regulated by reason.

§ 167. We have thus far considered volition as passing outwards, and producing changes in, and controlling organism and extra-organic things. But this suggests another question: how far can voluntary energy *turn inwards upon the states and activities of self?* and how far *are the mental states and processes themselves subject to will, and thereby under the control of self?* And first—

(a) How far is *intellection* subject to volitional control? We have answered this question already in dealing with volition. Will cannot *make* intellectual power, but it can control directly the use and application of the intellectual power which we have. And indeed every voluntary action, in its first and mental stage, involves (and indeed, some would say, is identical with) an effort of attention, i. e. a concentration of the whole intellectual power upon a single object of desire and the means of realizing it. For it is the at first intellectual effort of concentration that passes over into the physical overflow and movement.

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Idea and desire revive the associated movements and thus reproduce the action.

Self-control.

Control of thought.

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Control of
feeling.

• Some have tried, however, to show that the control of the intellectual activity which we exercise in attention is itself not *direct*—that what volitional effort really controls is the contractions of the muscles of the sense-organs and limbs, and that it is only by controlling the muscles that we can control thought and ideation (p. 378). And in support of this, they point to the fact that even in subjective thinking, attention involves a straining always of certain muscles. But this muscular strain in attention is probably the effect, rather than the cause of attention.

✖ (b) How far, then, are the *feelings under the control of will*? They cannot be acted on directly by will; a feeling is not a *thing* that can stand by itself, and be acted on. Feelings are mental states or effects rising out of things and ideas of things, and can be controlled only by controlling the things and ideas out of which they rise, *i. e.* indirectly through the medium of intellectual and muscular control.

• Thus we cannot directly suppress a pain by merely willing the pain away; but we may do so by removing its cause. We cannot suppress a sorrow by merely willing to do so, but we can do it to some extent by drawing away the attention from the ideas or things which give rise to the sorrow, and fixing it upon ideas or things not associated in any way with the sorrow. It is ideas or things that keep the feeling before the mind by force of association; and if we can revive or dismiss them by effort of will, we thereby revive or dismiss the feeling also.

But some of the above constituents of voluntary action require separate consideration—particularly the phases of desire and deliberation, and the act of volition or determination itself. Hence—

XXXIV. THE SOURCES OF PURPOSEIVE ACTION.

The springs
of action.

§ 168. The ultimate springs of action are the wants of our nature. All action is effort to supply a want, to overcome some limitation, or imperfection, and attain a higher stage of perfection or self-realization. There is,

therefore, a rising scale of wants—from those springing out of the present needs and conditions of the organic life, up to the higher needs of which the rational self ultimately becomes aware, as essential to the satisfaction and perfection of its higher nature. A classification of these wants is equivalent to a classification of the springs of action, which is, however, commonly left to ethics (the business of which is to consider what is essential to the highest perfection of the self, and how, therefore, it should regulate its actions):

Now wants manifest themselves in consciousness as *feelings of uneasiness*—feelings more or less disagreeable and painful. At the lower end of the scale (in connection with the process of organic life) these feelings of want take the form of *appetites*; and higher in the scale (in the stage of rational life, and in combination with ideas and thought) they give rise to *desires*.

§ 169. I. *Appetites* are the feelings which arise directly out of the want of what is needed for carrying on the processes of organic life—for the healthy working of the organism as the physical basis of life and mind—without any previous idea or process of thought. These processes,—*e. g.* the working of the limbs in locomotion and physical labour, the working of the nerves and brain in thought and volition, and the working of the organs of circulation, nutrition, secretion—all involve expenditure of energy and waste of substance, which manifests itself mentally in *periodically recurring feelings of inanition and want*. And these feelings are called *appetites*.

How then are these recurring organic wants satisfied? (1) *At first by automatic actions*.—They manifest themselves at first in painful feelings merely, without any *idea* of what is needed to relieve them. Hence, if they are to be relieved at all (if the creature is

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Two stages.

Those rising directly out of the requirements of the organism.

And satisfied by instinctive actions.

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CHAP. XXXIV.

not to perish from want), it must be by means of *automatic movements—reflex or instinctive*.

* Thus in animals, and to some small extent in infants also, there is a connate connection between such feelings of want, and the movements needed to relieve the wants. The young mammal sucks to satisfy its appetite almost as soon as it is born, the young bird runs and picks up seeds and beetles almost as soon as it is hatched from the egg. The process of satisfying appetites in them is, therefore, either *reflex* or *instinctive*.

Or rising into
desire, and
satisfied by
voluntary
actions.

(ii) *Afterwards by voluntary actions, through idea and desire*—The infant also has some connate (reflex or instinctive) tendency to suck and swallow in obedience to the feelings of appetite. But at first it is comparatively helpless as compared with the young animal; and the satisfaction of its want depends on the guidance of others, until experience has accumulated, and reason begins to develop. Guided by others, it gradually acquires *ideas* of what is needed to supply its wants, and of the means of attaining it; and thenceforth begins to *desire* what will relieve them, and performs the actions by the impulse of *desire*, and with the guidance of *idea*. Thus the satisfaction of wants comes to be by *voluntary* action.

* Thus appetite is a term applied to a particular class of wants and feelings of want; and may be present as feeling (as an organic sensation in fact) without any *idea* of what is needed to relieve it. Desire, on the contrary, is the state of mind which arises from *thinking* of a want, and what will satisfy it. Appetite, therefore, is common to all sentient creatures; desire proper is limited to *thinking* beings. Hence—

Those rising
out of idea-
tion or
thought—
desires.

§ 170. II. *Desire* is a phrase in the mental stage of every *voluntary* action. The feeling of want, which is the ultimate mental spring, suggests to the experienced mind the means or object by which it may be relieved, and thereby also the satisfaction of relieving it, and

this idea excites the state of mind called *desire*, or craving and longing. Desire, therefore, includes the following constituent factors:—

(1) A feeling of pain or uneasiness, which is found afterwards to rise out of *want*, *defect* or *imperfection* of some kind.

(2) The *idea of something* the attainment of which will satisfy the want, and remove the imperfection—accompanied with what may be called an *ideal feeling* of the satisfaction which will result from the attainment of the desired object.

(3) Finally this idea and ideal feeling excites the *state of desire* itself; which is properly the state of *longing and craving* for the realization of the idea and for the satisfaction which will result from it, combined with a feeling of *expectation* and *hope* that it will be realized.

Thus, in respect of *quality* or *tone*, desire is a mixed state. The feeling of want itself is disagreeable. The ideal feeling of satisfaction, and the feeling of hope are agreeable—especially when heightened by the working of imagination. *Desire*, therefore, involves an intermixture of agreeable and disagreeable feelings. But the agreeable is superficial and unreal (depending so much on imagination and hope); while the disagreeable (springing out of the want) is fundamental; and the *motive force* of desire consists in the impulse to escape from the disagreeable state by attaining the desired end.

• Thus it is the connecting link between emotion and volition. ~~It is both an emotional state, or state of feeling rising out of thought (ideation); and, at the same time, a yearning and striving towards action, and indeed the incipient phase of activity.~~

The question whether pleasure is the only object of desire—whether desiring a thing, and finding it pleasur-

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CHAP. XXXIV.

Analysis of
desire.

Want.

Idea.

Craving.

More painful
than pleasurable.

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Relation of
desires to
self.

Mind as ag-
gregate of
desires, etc.

Mind acted
on by desires
as if from
without, but
chooses be-
tween them.

Mind deter-
mines its own
desires.

able, be but two ways of expressing the same fact, as some have said—may be left to ethics.

§ 171. The relation of desire to the self and to volition has been understood differently by different schools.

(a) According to the sensationist theory of mind the self is regarded as only the aggregate of actual and possible ideas, feeling, and desires. The desires (being of the nature of forces, or impulses to action) are in continual conflict with each other, and check and hold each other in equilibrium until some one grows stronger than the other, overcomes them and forces its way into action for its own realization.

(b) According to another view, the self is more than the sum of the conscious states—it is a substantial principle of activity. But the desires are themselves forces also, and act on the self from without, each desire impelling or pulling (as it were) the self to act for its own gratification. But the energy of the self is stronger than that of the desires, so that it keeps them in check until it has *deliberated and chosen between them*, and then gives free scope and realization to the chosen one, repressing the rest for the time being.

(c) But still another view is possible. Such mutual externality and opposition among states of mind is inconsistent with the unity of the self. Desires are functions of the self, and not forces acting on it and on each other—as if external to the self. The self really determines (in a sense) its own wants and desires. It comes to understand in what its own highest good and perfection really consists, and what its real wants therefore are; and this understanding determines the direction of desire. The healthily constituted mind is not dragged about by its desires, but desires what it discerns to be for its highest good. In such minds desire follows reason.

All these theories, however, may be partially true. In very low forms of mind, *e. g.* in animals, mind may be nothing more than the aggregate of feelings and impulses, working automatically. In higher forms the self may be differentiated, but the desires and appetites may still be essentially external forms. In the highest forms of mind, however, the impulses have become altogether incorporated into the unity of mind, and made subservient to reason. The same gradual attainment of unity is seen in the development of the organism and nervous system.

It is true, however, that this subordination of desire to reason is not an "accomplished fact" in all minds; for most are liable more or less to be "carried away" by the strength of passion or by "fixed ideas." It is itself a *good* and *end*, which every mind desires and strives to attain.

Hence the state called the conflict of desires or motives requires further consideration.

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CHAP. XXXV.

These theories represent stages of development.

XXXV. THE FACTORS OF PURPOSEIVE ACTION.

§ 172. Conflict of motives, deliberation and choice are, we have already found, factors in the preliminary and mental stage of every voluntary action. The term *motive*, however, is used with several different meanings.

(1) It is sometimes used for the ultimate springs of all actions alike, which have been defined as *feelings of want* rising out of some need or imperfection of the organic or mental system. (2) It is used more properly for the *idea of what will supply a want*, and the *ideal feeling* of the satisfaction of attaining it—the *object of desire* represented in idea. (3) It is used also for the complex *state of desire*, to which the above elements of want and idea give rise, and which virtually includes them (so that *motive* may be said to be a *feeling of want plus* the idea of what will satisfy it *plus* the state of yearning for the realization of the idea).

✓ When a conflict of motives is spoken of, the third of these meanings must be meant, because only forces can conflict, and desire may be regarded as in a sense incipient force or tendency.

Motive.

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CHAP. XXXV.

Plurality of
motives.

What then can be meant by a *conflict of motives*? As there are always many wants, so there are always many objects of desire and many motives before the mind. But, never more than one motive or desire can be realized at one time; and, besides, many are inconsistent with each other, so that the realization of one makes impossible that of another. Hence the question is continually before the mind: *which of two alternative motives shall be realized? which of two desires shall be gratified? which of two possible lines of action shall be followed?*

Now the determining of this constantly recurring question is *volition proper*; and if we could explain precisely how mind thus determines between two alternative ends of action, we should thereby be explaining the nature of volition. And it is in the course of this process of determination between alternative motives that the subordinate processes called *conflict of motives, deliberation, and choice* come in. Hence—

Rivalry of
motives.

I. *As to the so-called conflict of motives.*—The common phrase “conflict of motives” applies *literally* only to the view of the sensationist school. According to this view, mind is only the aggregate of feelings, ideas, and desires. Desires are forces, each tending to occupy the whole field of mind for the time being, and work itself out in action. If only one were present at once, it would occupy the whole mind and thus realize itself without opposition; and this is what takes place in cases of *passions* and *fixed ideas*. But there are usually two or more present simultaneously, and only one can be realized at a time. Hence, as each presses forward towards its own realization, they come into conflict, check, and hold each other in equilibrium for a time; and by this mutual *obstruction* and *inhibition* of motives action is suspended until some one motive proves stronger than the others, so as to exclude or suppress them for the time be-

ing, occupy the whole mind, and work itself out in action.

• This, then, would be *literally* a conflict of motives, in which one at last asserts its superior strength, and prevails over its rivals. But according to the other views of mind mentioned above, the self's hesitation between opposite motives can hardly be called a *conflict between motives* in a literal sense; it is a proress of *choosing and deciding* between them on the part of the self. It is not motives that determine the issue among themselves according to their relative strength, but the self that decides between the motives, after *deliberation*.

§ 173. II. *As to the deliberation*,—How then, if there is a conflict of motives, does the strongest motive assert its superior strength and prevail? Or how, if the determination is an act of choice, does the self finally decide between rival motives? According to either view, the determination involves the intellectual process called *deliberation*, or consideration of all the means, accompaniments, and ulterior results of the rival actions.

Thus the suspension of action by the rivalry and mutual inhibition of motives has this effect, that it either throws mental activity back into the form of thought, until one of the motives proves itself stronger than the others (as according to the sensationist view); or rouses the attention of the self to the rival motives, and prompts it to choose between them (as according to the other view). According to either view, the thinking power is roused and concentrated on the rival motives. Being thus stimulated by attention, each motive-idea awakens, by association and inference, ideas of all the probable circumstances attending its own realization—the means needed to realize it, including the time, labour and outlay, and the ulterior consequences likely to follow to self and others. Now these foreseen (inferred) accompaniments are themselves all more or less pleasurable or painful, and therefore awaken desire or aversion for their own sake. Hence if the accompaniments and consequences of a particular motive are themselves

Inhibition
and delibera-
tion.

Anticipation
of consequen-
ces.

PART VIII
CHAP. XXXV.

more or less desirable, their desirableness adds itself on to that of the original motive, and strengthens it. If they are undesirable, then the aversion felt towards them detracts from, or eliminates altogether the desirableness of the original motive.

• Thus, when the desirableness of the original motives has been strengthened or diminished by the attraction or repulsion of their consequences (inferred and pictured in idea), their *absolute* strength or desirableness becomes manifest, and either some one prevails over the others by its superior strength, or the self chooses one as more desirable than the others. And thus the dead-lock of rival motives comes to an end.

Hence this process of thought is called *deliberation*, i. e. a *weighing* of the rival ends, to ascertain their absolute value. And it consists in a process of *inferring and picturing in imagination* the accompaniments and consequences of the rival lines of action, so as to make their value apparent.

§ 174. III. *As to the final act of determination, decision, or volition proper.*—When the superiority of one motive over another has been made clear by deliberation, then the final decision between them takes place. This also has been explained in two ways—by the comparative strength of the motives; or by choice between the motives, irrespective of their strength.

(a) *By the comparative strength of the motives in their conflict among themselves.*—If we suppose that mind is nothing more than the aggregate of feelings, ideas, and desires, we must suppose that, after deliberation, one motive or desire proves decidedly *stronger* than the rest (*viz.* from having been re-inforced by the desirableness of its accompaniments and consequences, which deliberation has brought up in idea). Then it will manifest its strength, in conflict with its rivals by suppressing, or excluding them from the field for the time being, occupying the whole field to itself, and thereby working itself out into action and realization automatically.

Determination
of
volition

How brought
about.

Volition
determined
by the
strongest
motive.

• Volition proper, then, will consist merely in this automatic process by which one motive or desire asserts its superior strength over its rivals in the conflict of motives, and thereby works itself out to the exclusion of the rest. This is the view of determination or volition given by what may be called the *sensationist* or extreme *experientialist* school (Hume, Bain, Spencer).

(b) *By free choice between the motives or desires* irrespective of their so-called strength, or *by self-determination*.—If we suppose that mind is more than the sum of ideas, feelings, and desires—that it is itself a principle of activity,—then we cannot suppose that it is wholly determined by them, as if it were a merely passive product. We must suppose either that the desires are forces tending to influence the thinking principle (as if from without), but it has the power of *choosing* between them; or we must suppose that the mind has something to do with the *making* of the feelings and desires. We cannot suppose that the feelings and desires make the mind.

• Thus we can understand that, though the self may be influenced by its desires or motives, it is not passively *determined* by any one of them, and forced to realize that one; but determines in its own way which one shall be realized, and freely identifies itself with the realization of that one for the time being.

This self-determination on the part of the thinking principle is often described as an act of *choice*. It is said to deliberate upon, and choose freely between its rival desires, as if they were something presented to it from without. The *choice*, however, can hardly be regarded as more than metaphorical. Motives or desires are not anything presented to the mind from without, to choose between. It would be nearer the truth to say that it *makes* its desire and motives, *viz.* by reflection or deliberation on its own highest good and the means of realising it.

The question of the determination of volitions, however, has been the subject of a long controversy, *viz.* that concerning the *freedom of the will*.

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CHAP. XXXV.

Volition determined by self.

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CHAP. XXXVI.

XXXVI. THE DETERMINATION OF THE WILL.

The problem
of determina-
tion.

§ 175. The question here is not about freedom in the ordinary sense of the word. We do not here ask *whether we are free to do what we will, i.e.* whether we are free from restraint or compulsion (which is the common meaning of freedom). The question here is, *whether we are free to will what we will, or how we come to will it*—how, in choosing between two equally possible ends of action, we choose one rather than another—whether in willing a particular line of action, we are determined to will it by a power or force higher than ourselves, determining volitions like all other, events according to uniform law, or whether our willing or not willing it, depends essentially upon ourselves alone, and is therefore *self-determined*. On this subject there are two opposite opinions—*other-determinism* or *necessitarianism*, and *self-determinism*, *libertarianism*, or *freedom of will*.

Theory of
necessitarian-
ism.

I. According to *necessitarianism*, willing, though a mental event, is on precisely the same level, and subject to the same law of universal causality, and is a link in the same system of causes and effects, as physical events. Now every physical event is determined by antecedent circumstances, and these by others, and so on; so that whenever a certain combination of circumstances occurs, the same consequent always and necessarily follows; and when the antecedents are known, the consequent events can be calculated beforehand.

Identity of
physical and
mental causa-
tion

So it is with volitions. Every act of will is determined by an antecedent combination of circumstances in the same way as physical events are caused; and these antecedents by other antecedents, and so on indefinitely; so that, if a person's constitution and circumstances could be fully known then his conduct could be predicted with the same certainty as an eclipse of the sun, or the rising of the tide.

Now the antecedent forces which, directly determine a person's volitions are his *motives* or *desires*, the stronger of which necessarily overcomes the weaker and passes into action, and in doing constitutes the volition of the moment. The strength of any particular motive, again, depends (1) on the external circumstances or environment influencing the individual from without, and (2) on the mental character and constitution of the individual himself, which depends, again, (3) on the structure of his brain and organism, and the tendencies which he has inherited thereby from his ancestors; while his ancestors, again, owed their structure of brain and organism to still earlier conditions, and so on indefinitely.

Thus every voluntary action is but a link in an unbroken chain of causes and effects extending back into an indefinite past, and forward into an indefinite future. We think our volitions free, Spinoza said, simply because we are conscious of the volitions without being conscious of the causes which determine them. The magnet mounted on a pivot turns towards the north by a necessity of its own nature; but if it were conscious of itself, it would think that it does so by its own free will; and if it were touched and diverted from that direction, it would think that its freedom is being interfered with.

§ 176. This *necessitarian* view of will has been supported by arguments derived from several different points of view:—

(i) It may be supported by arguments drawn from the *sensationist* (and still more the *materialist*) *theory of mind*. If mind is nothing more than the sum of the ideas, feelings, and desires, then volition will be the resultant of the conflict of motives, and consist merely in the prevailing of the strongest desire or set of desires, for the time being. And the comparative strength of desires will depend on antecedent circumstances, and these on others, and so on (Hume, Bain, Spencer).

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The forces which determine will.

Freedom an illusion.

Confirmed by

The aggregate theory of mind.

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CHAP. XXXVI.The monistic
metaphysic.

✱ (ii) It may be supported by arguments drawn from that *metaphysical theory of the world*, which regards all finite things as modes or factors of the working of a single universal power, or self-transformations of a single absolute substance. From this it would follow that they possess no individuality or independent causality of their own, but act as they are determined to act, partly by other finite things limiting and influencing them from without, and partly by the universal power operating within (Spinoza).

The theory
of physical
causation
and conser-
vation of
energy.

✱ (iii) Or it may be supported by arguments drawn from the physical laws of *causation* and *conservation of energy*.

(1) A volition not determined by antecedent circumstances would be *an event without a cause*, which is impossible. Science has proved the law of causality to hold universally throughout nature, and we cannot suppose that mind presents any exception to it. (2) Again every action is the application of a certain amount of energy. Now if the energy of an act of volition were not derived from some previous event (*i. e.* if it were not caused from without like physical events), then every volition would be so much energy added on to the amount of energy already in the world. But the principle of conservation requires us to suppose that *the amount of energy in the world is constant*—never either increased or diminished. Therefore a volition, like every other act, must be an application of energy derived from other acts, *i. e.* it must be caused and determined by antecedent action.

The possibi-
lity of fore-
sight

(iv) The same conclusion has been drawn from theological considerations. God designs and foresees all things. But there can be no pre-vision of what is not pre-determined. The astronomer can predict an eclipse because it is determined by antecedent causes. Therefore God's foresight implies that God has determined beforehand the course of the world, and actions of individuals.

And these deductions are confirmed, it is maintained, by *facts of ordinary experience*. Thus—

* (1) In business and social intercourse it is always assumed that a person's actions spring uniformly out of his mental and bodily constitution and his circumstances and motives, and can be known beforehand so far as these are known. If actions were not thus determined by law, they would be random and arbitrary, and the business of life would be impossible, no person ever knowing how any other person would act. Practical wisdom and common-sense assume that actions are capable of being foreseen, *i. e.* inferred from antecedent circumstances; and if deducible from them, they must be determined by them. The very possibility of foresight implies determination.

(2) Statistics especially prove that people act uniformly in the same way, under the same circumstances, *e. g.* by showing such facts as the uniformity of the marriage-rate (rising and falling with the rate of wages and the season's crop), of the number of crimes and suicides, of the number of unstamped letters, and so on, which repeat themselves with mathematical regularity year after year.

(3) Public law and justice would be meaningless, if minds were not determined uniformly by motives, because the penalties which they hold out for certain actions are simply motives to deter people from performing them; and if motives did not determine actions, then threats and penalties would be meaningless. Education also would be useless, because it consists largely in opening up new regions of motive to mind, with a view to the regulation of conduct.

§ 177. II. *The theory of free will or self-determination*, on the other hand, affirms that volition is not on the same level with physical events, and not subject to causation *in the same sense*, but that *the self freely determines its own voluntary activities from within itself, and for its own ends, without being constrained or determined to do so by any force external to itself*.

For mental causality is different in kind from physical. *All physical events are movements, or changes of position in space. And the movement of one thing*

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And by
many facts
of ordinary
experience.

The theory
of free will.

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CHAP. XXXVI.

Difference
between men-
tal and phy-
sical causa-
lity.

Physical cau-
sality suppo-
ses a source
of power out-
side the phy-
sical series.

And which
manifests
itself most
directly in
mind.

is determined by that of another thing, and so on—the motion being transferred from one to another. In physical things, therefore, the determination is from without, and by a force acting on the outside of things. Volition, on the contrary, is determined *from within the mental principle itself, and not by impulsion from without*. It is *internal*, not *external* causation; and this of itself makes an essential difference.

✕ Again, movement itself must have its ultimate source in power which moves without being moved—determines without being itself determined by anything external—and which *makes* the chain of physical causes and effects instead of being *made by it*, or being a part of it—and which must spring from within, instead of merely impelling things from without (as mechanical force does).

Now mind is such an ultimate source of power. It does not belong to the world of passive products acted on from without by physical causality—to the chain of natural causes and effects—but rather to that source of power which makes and determines the outer order of nature. It has therefore the power of internal self-determination; and this self-determining power is manifested in volition, in which *the self determines itself to act in such and such a way, without being determined to do so by anything antecedent to, or external to itself*.

✕ And this self-determination may be explained in this way. ✕ A true psychology shows that the self is not merely the sum of feelings, ideas, and desires, but a permanent essence and principle of activity, which reacts upon influences from without, transforms them into the means and materials of its own knowledge, understands thereby its own nature and its own highest good, and what is conducive to its highest good, and thus adapts its desires, and determines the direction of its own actions, towards its own good. A rational being is therefore, by the nature of the case, a free being. ✕

This is self-determination through reason, and is something essentially different from making mind to be a passive product of antecedent and external forces—a link in the chain of mechanical (external) causation.

It is often explained as a *power of choosing freely* between alternative motives. The self is acted on and *influenced*, indeed, by desires as motive-forces but not determined by them. It retains the power (except when “carried away” by extreme bursts of passion) of deliberating, and *freely choosing* which motive shall be realized, and suppressing the others. Free will is not, therefore, a power of acting without motives (as some have thought), but a power of choosing and determining which motive shall be realized.³ But we may go beyond this dualism of self and motives, and say that it is not acted on by motives as forces from without, but determines from within, by its own thought, what its desires shall be, and which of them shall be realized.

§ 178. Now this belief in self-determination or freedom of will rests mainly on—

(a) *The evidence of self-consciousness.*—In willing we are always conscious of willing freely, or of determining the course of our actions from within ourselves, and for our own good, without being determined by anything antecedent to or external to ourselves. We are conscious, not of being determined by our desires, but rather of determining what we shall desire—of adapting our desires to what we discern to be our highest good.

And the consciousness of freedom is specially distinct in the processes of deliberation, in which, instead of being carried away by motives operating automatically, we strive to discern which of the motives that first present themselves, is the most intrinsically worthy and desirable, and identify ourselves with that; or as it is commonly expressed, we choose freely between the motives which present themselves to us.

(b) *The evidence of moral consciousness.*—We feel that it is our *duty* to act so and so, that we are under an *obligation* to do so, and that we are accountable or responsible for what we do. Now such convictions would be impossible if we were not conscious at the

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Self-determination as choice.

Self-determination confirmed by self-consciousness.

Moral consciousness.

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CHAP. XXXVI.

same time of being free to act so or otherwise. We cannot feel that we *ought* to will so and so without feeling at the same time that we *can* will so—that we ourselves determine the direction of our will.

* Necessity would take away all meaning from duty and responsibility, and make morality, justice, accountability, as meaningless in the case of man as in that of animals.

And the idealist metaphysic.

(c) The theory of freedom is confirmed also by a more correctly reasoned *metaphysical theory of the world*. According to such a theory the deepest self lies altogether outside of the series of events in time (causes and effects) and the aggregate of passive products which constitute the outward world of experience and to which the laws of physical causation apply; and shares rather in the ultimate self-determining power, which determines the series of outward events in time without being determined by them.

* Thus Kant tried to show that the self, as a metaphysical principle above time, determines the whole conduct of its life by a single act of volition which is above time; though it manifests itself phenomenally in many particular actions which are in time.

Foresight does not prove necessity.

§ 179. The necessitarian arguments, again, may be met by such considerations as these:—

(i). The fact that people act in the same way under the same circumstances (as proved by common experience and by statistics), and that their actions can be to some extent foreseen, does not prove that they are determined so to act by forces above and external to themselves. The truth is simply that, under the same circumstances, rational beings find their own interests to be the same, and therefore turn their desires in the same directions, but turn them freely.

* God knows the future, not because he infers the future as effects are inferred from causes, but because past, present and future are all present to Him intuitively,

so that he sees, and does not infer,—knowledge even of the future is to him intuition, and not inference.

(ii) Free self-determination does not make volition to be an event without a cause. The self causes it. But what, it may be asked, determines the self to cause it? The answer is: its own conception of its own good. But to be determined by its conception of its own good *is to be determined by itself—to be self-determined* from within. Volition is therefore a *caused event*, though mental causation is essentially different in kind from physical,—being from within and not from without.

* Some, however, have maintained what is called *liberty of indifference*, or *indeterminism*—that we choose without any motive at all, or between motives of equal strength. One chooses a coin out of a heap of coins before him without having any motive for choosing one rather than another. If he required a motive for such an act, he could never choose at all. If an ass, it was once said, were placed between two bundles of hay of exactly equal attraction, then he would be kept in equilibrium between them until starved to death, if he could not choose without a preponderant motive. But this is evidently contrary to common-sense, because such indeterminism would reduce voluntary action to mere chance.

(iii) As to the argument that an act of free will would increase or diminish the sum-total of energy in the world, and thereby violate the principle of conservation—the answer is sometimes given that will-force may *change the direction* of physical forces without increasing or diminishing their amount; or that it may add or eliminate in one way as much as it eliminates or adds in another, leaving the sum unchanged. Such arguments may be fanciful; but the truth is that the ideas of *energy* and *conservation of energy* are themselves far too obscure and uncertain for any reliable argument to be based on them, whether against freedom of will, or in favour of it.

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Self-determination not the same thing as indeterminism.

The question not affected by theory of conservation.

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